

# MONTHLY WEATHER REVIEW.

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BOARD OF EDITORS { Mr. Horace E. Smith, Chief Clerk of Weather Bureau,  
Professors Henry A. Hazen, Thomas Russell, and Charles F. Marvin, and  
Mr. Edward B. Garriott, in charge of Review Room.

## INTRODUCTION.

This REVIEW is based on reports for March, 1893, from 2,950 regular and voluntary observers. These reports are classified as follows: 164 reports from Weather Bureau stations; 44 reports from United States Army post surgeons; 2,015 monthly reports from state weather service and voluntary observers; 210 reports through the Southern Pacific

Railway Company; 490 marine reports through the co-operation of the Hydrographic Office, Navy Department; 27 reports from Canadian stations; marine reports through the "New York Herald Weather Service"; monthly reports from local services established in all states and territories; and international simultaneous observations. Trustworthy newspaper extracts and special reports have also been used.

## CHARACTERISTICS OF THE WEATHER FOR MARCH, 1893.

### TEMPERATURE.

Except in parts of the Ohio Valley and the Lake region the month was colder than the average March. The first important cold wave overspread the central valleys and the South-eastern States during the 3d and 4th, carrying the line of freezing weather to the immediate Gulf coast and over the northern part of the Florida Peninsula, and causing the lowest temperature on record for March in the south Atlantic states, Tennessee, and Arkansas. A second severe cold wave advanced from the Rocky Mountains to the Atlantic coast from the 12th to the 15th, attended by freezing weather in northern parts of the east Gulf states. The observer at Wilmington,

C., reports that thousands of dollars were saved to strawberry growers in that section by the Weather Bureau warning of the cold wave of the 4th. Heavy frost occurred as far south as Tampa, Fla., on the 5th, at Dallas, Tex., on the 18th, at Columbia, S. C., on the 19th, at Wilmington, N. C., on the 20th, and at Adairsville, Ga., on the 30th.

### PRECIPITATION.

About the normal amount of precipitation fell over the greater part of New England, in the upper lake region, and on the northeast slope of the Rocky Mountains. In north-eastern Florida, northwestern Washington, and southwestern California the monthly precipitation was more than 5.00 inches in excess of the usual amount, and at Jacksonville, Fla., and Neah Bay, Wash., it was the greatest ever reported for March. In an area extending over Nova Scotia and eastern Maine, and from southern Virginia over the interior of the east Gulf states and southern Tennessee the monthly precipitation was 3.00 to 4.00 inches less than the average, and at Eastport, Me., Baltimore, Md., Key West, Fla., Galveston, Tex., and Memphis, Tenn., it was the least on record for March. At Pikes Peak, Colo., the monthly snowfall was 179

inches, and a depth of 145 inches was reported at Summit, Cal. In the mountains of New England, and at points in Upper Michigan, northern Wisconsin, and northern North Dakota 20.00 to 30.00 inches of snow fell. A severe snowstorm extended from the middle Mississippi valley over northern parts of the Gulf States and to the middle Atlantic coast during the 3d and 4th. The heaviest snowstorm on record for that section was reported in the eastern part of Fresno County, Cal., on the 11th. Heavy snowstorms prevailed in the Northwestern States on the 13th and 22d.

### STORMS.

The most disastrous storms of the month occurred in the east Gulf states the evening of the 3d, in Oklahoma the evening of the 22d, and in the middle Mississippi and lower Ohio valleys the afternoon and evening of the 23d. These storms resulted in considerable loss of life and immense destruction of property. Referring to the storms of the 23d the observer at Louisville, Ky., reports that the special prediction sent from this office the night of the 22d, in anticipation of severe local storms in the central Mississippi and lower Ohio valleys, prompted precautionary measures by river men which resulted in an immense saving of floating property, and that commendations heard on all sides and received from all sections of the state prove that the warning was one of the most successful ever issued by the Weather Bureau.

### FLOODS.

Destructive floods, resulting from ice gorges, occurred in rivers and streams of New York during the second decade of the month. At Albany, N. Y., the Hudson River reached the highest point noted since 1874, and low-lying parts of the city were submerged. From the 10th to the 13th flood conditions prevailed along the Genesee River in western New York. Floods were also reported along the Susquehanna River, Pennsylvania. At points along the Grand River, Michigan, the water was reported the highest on record. Streams overflowed their banks in the Northwestern States. The latter part of the month destructive floods occurred in the San Joaquin Valley and in southwestern California.

## ATMOSPHERIC PRESSURE (expressed in inches and hundredths).

The distribution of mean atmospheric pressure for March, 1893, as determined from observations taken daily at 8 a. m. and 8 p. m. (75th meridian time), is shown on Chart II by isobars.

Chart VI exhibits the normal distribution of atmospheric pressure and prevailing wind-directions over the United States for March. The publication of the charts of this series is preliminary to the publication by the Weather Bureau of specially prepared data and charts showing meteorological and climatic features and conditions of the United States.

In March, 1893, the mean pressure was highest east of the Mississippi and south of the Ohio rivers, and over North Dakota and the eastern Saskatchewan valley, where it was above 30.10, the highest mean reading, 30.15, being noted at Augusta, Ga. The mean pressure was lowest on the extreme north Pacific coast, where it was below 29.85, and the mean values were below 30.00 over Maine and the Canadian Maritime Provinces, over the west part of the southern plateau region, and from the Pacific coast north of the 40th parallel over the northern plateau region.

In March there is usually a decrease of pressure over the United States and Canada, the decrease being most marked along the New England coast, over the Canadian Maritime Provinces, and in the Saskatchewan Valley, where the mean pressure is more than .10 lower than for February.

A comparison of the pressure chart for March, 1893, with that of the preceding month shows a general decrease of pressure, except over northern New England where the mean pressure was somewhat higher than for February. The most marked decrease of pressure occurred over the northwestern part of the country, where it was .15 to .20.

The mean pressure for March, 1893, was above the normal from western Wisconsin over eastern Montana and eastern Assiniboia; it was also above the normal east of a line traced from eastern Upper Michigan to southern Illinois and thence to southern Arizona. Elsewhere the mean readings were below the normal. The greatest departure above the normal pressure was reported in Nova Scotia, where it was .10 to .12. The most marked departure below the normal pressure was noted along the immediate north Pacific coast, where the mean values were .15 to .19 lower than usual.

## HIGH AND LOW AREAS.

The paths of areas of high and low barometric pressure over the United States and Canada for March, 1893, are shown on Charts I and IV, respectively, and some of the prominent features of the areas are given in the table at the end of this chapter.

## HIGH AREAS.

The high areas traced for the current month corresponded in number with the average number of high areas traced for March during the last 19 years. The average velocity of the high areas was about 2 miles per hour greater than usual.

Of the high areas traced for March, 1893, 7 advanced from the Saskatchewan Valley, 1 from the south Pacific coast, and 1 occupied Tennessee at the opening of the month. Two of the high areas from the Saskatchewan Valley advanced to the south Atlantic coast, 3 reached the middle Atlantic or New England coasts, 1 passed over Nova Scotia, and 1 disappeared by a decrease of pressure over the middle Mississippi valley. The high area from the south Pacific coast moved eastward to Texas, and thence to the eastern lake region. The high area which occupied Tennessee on the 1st passed off the south Atlantic coast. The following is a description of the high areas referred to:

I.—Occupied an area extending from eastern Arkansas over

Tennessee and north parts of the east Gulf states at the opening of the month, and moved thence off the Carolina coast by the evening of the 2d, attended on the 1st by a fall in temperature of 10° along the south Atlantic coast, and on the 2d by rain on the south Atlantic and east Florida coasts.

II.—The pressure increased over the Saskatchewan Valley during the 1st and 2d, and the evening of the 2d was 30.50 over southern Assiniboia and southern Alberta. During the 3d this high area passed southeastward over the Dakotas, with pressure 30.80 at Prince Albert, Sas., in the morning. On that date the temperature fell 30° to 40° from the southern half of Illinois to central and northwestern Texas, and the line of freezing weather reached central Arkansas. By the evening of the 4th the center of the high area had advanced to Oklahoma, the temperature had fallen 30° to 40° in the Gulf and south Atlantic states, freezing weather was reported at Meridian, Miss., Montgomery, Ala., and Charleston, S. C., the morning minimum at Chattanooga, Tenn., 14.7°, was the lowest temperature on record for March at that station, and the minimum at Little Rock, Ark., 16.5°, was as low as previously reported for March. The eastward movement of this high area over the middle and east Gulf states was attended by temperature below freezing and frost along the middle and east Gulf coasts and in northern Florida the morning of the 5th. The morning of the 6th heavy frost was noted at Montgomery, Ala., and light frost at Savannah, Ga., and Charleston, S. C.

III.—Followed closely number II and apparently united with that high area the night of the 5th. Number III occupied the region north of eastern Montana during the 4th; the morning of that date a 24-hour temperature fall of 20° was shown in the valley of the Red River of the North, and the temperature was 24° below zero at Saint Vincent, Minn. During the day and night of the 5th the high area passed southeastward over the central valleys to the east Gulf states.

IV.—Was apparently central over Lower California on the 10th. On that date the temperature fell 10° to 20° over the Rocky Mountain and plateau regions, and light frost was reported at Tucson and Yuma, Ariz. During the 11th this high area advanced to Texas, with pressure above 30.40 over southern New Mexico in the morning, the temperature fell 10° to 20° in the central valleys, and light frost was noted at Tucson, Ariz. By the evening of the 12th the high area had moved rapidly northeastward to the upper Ohio valley, and by the morning of the 13th had united north of the Lake region with an area of high pressure which had advanced eastward from Manitoba during the 12th. The morning report of the 12th showed a fall in temperature of 20° over the interior of the east Gulf states, and a fall in temperature of 20° to 30° was noted over Lake Superior the evening of the 12th.

V.—Appeared over Alberta on the 12th, following the passage of low area VI. The evening report of that date showed a fall in temperature of 10° to 20° over the Rocky Mountain region. During the 13th the pressure rose above 30.80 over the region north of North Dakota and eastern Montana, the temperature fell 30° to 40° in the middle Missouri valley, and the line of freezing weather reached Kansas City, Mo. The pressure continued above 30.80 over and north of northern North Dakota during the 14th, and the temperature fell 20° to 30° in the middle and upper Mississippi valleys and from the western lake region to the northern part of the east Gulf states. The evening of the 15th this high area was central over the Red River of the North Valley, and a ridge of high pressure extended thence to the lower Ohio valley. The morning report of that date showed freezing weather to the



north part of the east Gulf states, and in the evening a temperature fall of  $20^{\circ}$  to  $30^{\circ}$  was noted in the middle Atlantic and New England states. This high area moved rapidly south-eastward to the upper Ohio valley on the 16th, with a marked decrease of pressure, and passed thence off the New Jersey coast the morning of the 17th. The morning of the 16th the line of freezing weather was carried to central South Carolina, and heavy frost was reported in the interior of that state.

VI.—Following the advance of high area V the pressure continued high over the British Northwest Territory, and the evening of the 16th this high area occupied Assiniboia, with pressure above 30.50. Moving rapidly southward over the Dakotas and Nebraska during the 17th, with a fall in temperature of  $10^{\circ}$  to  $20^{\circ}$  in the Rocky Mountain regions and central Texas, this high area passed over the northern part of the east Gulf states during the 18th, and disappeared off the south Atlantic coast during the 19th, with light and heavy frosts in the middle and east Gulf and south Atlantic states the morning of the 19th. Light and heavy frosts were noted in the south Atlantic states the morning of the 20th.

VII.—The pressure continued high over the Saskatchewan Valley, following the southerly movement of VI, and during the 18th number VII moved southeastward over North Dakota. Passing thence rapidly eastward over the Great Lakes this high area disappeared off the New England coast during the 20th, its advance being unattended by marked changes in temperature.

VIII.—Appeared over the British Northwest Territory, following the passage of low area VIII, and the evening of the 21st occupied the region north of North Dakota, with pressure above 30.30. The morning report of the 21st showed a fall in temperature of  $20^{\circ}$  to  $30^{\circ}$  in the Red River of the North and eastern Saskatchewan valleys, and by the evening of that date the temperature had fallen  $20^{\circ}$  in Upper Michigan. Moving rapidly eastward during the 22d, with pressure above 30.70 at the morning report, this high area reached the middle Saint Lawrence valley, attended by a cold wave in Ontario, the Saint Lawrence Valley, and northern New England. During the 23d the high area moved south of east over Nova Scotia, and the cold wave extended to the Maine coast in the early morning.

IX.—Appeared in the Northwest on the 23d, following the passage of low area IX. On that date the temperature fell  $20^{\circ}$  to  $30^{\circ}$  over western Missouri and southern Kansas. During the 24th this high area advanced over the middle Missouri valley, a cold wave overspread the Ohio Valley and the southwestern lake region, and the line of freezing weather was carried to Oklahoma. During the next 24 hours the area of high pressure moved slowly northeastward to the Red River of the North Valley, and the cold wave extended over the upper Ohio valley and the eastern lake region. From the 26th to the 28th, inclusive, the pressure continued high over the upper lake region, and rose above 30.60 over northern Ontario the morning of the 28th. On the 26th there was a slight fall in temperature in the Atlantic coast states. Light frost was noted in northwestern Louisiana the morning of the 27th. During the 29th this high area disappeared off the middle Atlantic coast. The morning of the 29th heavy frost was reported in northern Arkansas, and light frost in northern Louisiana. During the 30th and the morning of the 31st the pressure continued high over the Gulf of Mexico and the Gulf States. The morning of the 30th light frost was noted at points in the interior of the Gulf and south Atlantic states.

#### LOW AREAS.

A large proportion of the low areas of March advance from the middle and northeast slopes of the Rocky Mountains to

the valley and Gulf of Saint Lawrence; less frequented tracks are traced eastward and northeastward from the southeast slope of the Rocky Mountains and the Gulf of Mexico. The average velocity of March low areas, 33 statute miles per hour, is 4 miles per hour less than the average rate of advance of low areas for January and February. An average of about 2 low areas per month advance from the north Pacific and traverse the continent in March.

The tracks of 12 areas of low pressure are plotted on Chart I for March, 1893, the average number traced for the corresponding month of the last 20 years being 12. Of the low areas traced for the current month 5 advanced from the north Pacific coast, 2 appeared over the British Northwest Territory, 4 apparently developed over the middle or southern Rocky Mountain regions, and 1 occupied Colorado at the opening of the month. Four of the low areas from the north Pacific coast, and the low areas from the British Northwest Territory reached the Canadian Maritime Provinces, and one of the north Pacific low areas occupied the Lake Superior region at the close of the month. The low areas from the middle and southern Rocky Mountain slopes passed eastward off the middle and south Atlantic coasts. The low area from Colorado disappeared north of the Saint Lawrence River. The average velocity of the low areas was about 4 miles per hour greater than usual.

Among the more notable features of the month were the destructive storms in the Southeastern States the evening of the 3d, and those of the 23d in the states of the Ohio and middle Mississippi valleys. The storms referred to attended the passage of low areas II and IX, respectively, and are described under "Local Storms."

The following is a description of low areas whose paths are shown on Chart I:

I.—Apparently developed over the middle Rocky Mountain region during the 1st. By the evening report of the 2d the storm-center had advanced eastward to Illinois, with pressure below 29.80, and rain had fallen in the Mississippi and lower Ohio valleys and the Gulf States. During the 3d the center passed northeastward over the lower lakes with a marked increase in energy, and snow was attended by high northwest winds and rapidly falling temperature in the middle and upper Mississippi and lower Ohio valleys and the Lake region. By the morning of the 4th this low area had disappeared north of the Saint Lawrence Valley, and the snow area had extended over the middle Atlantic states and the greater part of New England.

II.—Developed the night of the 2d in the southwest part of a trough of low pressure which extended from the Lake region to New Mexico, and the morning of the 3d was central over southwestern Arkansas, with pressure below 29.80. During the 3d this low area was forced eastward by the rapid advance from the Northwest of high area III, and at the evening report a trough of low pressure extended from southern Virginia to the middle Gulf coast. The elongated area of low pressure was bounded by the isobar of 29.60, and included two distinct cyclonic areas, or storm-centers, one of which was central over western North Carolina, and the other over central Alabama. The southern branch of this low area was attended, the evening of the 3d, by local storms of exceptional severity along a line traced from east-central Mississippi to west central Georgia. Snow, with rapidly falling temperature and high winds, occurred in the Mississippi Valley as far south as Memphis, Tenn., and rain and westerly gales were general over the Gulf States. By the morning of the 4th the center of disturbance had passed off the North Carolina coast, with pressure below 29.30, westerly gales prevailed along the south Atlantic and Florida coasts, and the snow area had extended to central Alabama and central Georgia. During the 4th this low area moved rapidly north-

eastward over the ocean, attended by severe north to north-west gales from Maine to Florida, snow, followed by clearing weather from the Carolinas northward, and much colder weather in the Atlantic coast states.

III.—Advanced from the British Northwest Territory and occupied Manitoba the morning of the 6th. By the evening report of the 6th the center had passed to the region north of Lake Superior, with pressure below 29.70, and light snow flurries in east-central Wisconsin. Moving rapidly eastward this low area disappeared over or north of the Gulf of Saint Lawrence during the 7th, with light rain or snow, followed quickly by clearing weather, in the middle Atlantic and New England states.

IV.—Apparently advanced from the south Pacific coast, and the evening of the 6th was central over northern New Mexico, with pressure below 29.90, and rain from southern California to extreme western Texas. During the 7th the center passed to south-central Kansas and a subsidiary development appeared over the lower Rio Grande Valley, the temperature rose 20° in Arkansas and Tennessee, heavy rain fell in areas in the Western and Southwestern States, and hailstorms were reported in south-central Texas. During the 8th the low area moved northeastward and at the evening report was central near Davenport, Iowa, with pressure below 29.20. On that date heavy rain fell in the middle and upper Mississippi, lower Missouri, and Ohio valleys, and the southwestern lake region, and severe local storms were reported in southern Illinois and southern Indiana in the afternoon. During the 9th the center of disturbance passed off the New Jersey coast, and by the evening report had united with an area of low pressure which occupied Chesapeake Bay in the morning, heavy rain fell in the lower lake region and from New Jersey and Pennsylvania over New England, and gales prevailed along the middle Atlantic and New England coasts.

V.—Advanced from the north Pacific and the evening of the 7th was central north of Washington with pressure below 29.40. On that date the temperature rose 30° to 40° over northeastern Montana, and rain fell along the Pacific coast and over the northern plateau region. During the 8th the storm-center advanced to southern Alberta, rain continued along the Pacific coast and over the northern plateau region, and snow fell over the middle plateau region. Moving slowly south-eastward over the Missouri Valley this low area reached southwestern Minnesota the evening of the 10th, with snow in the Missouri Valley, and rain in the west Gulf states. During the 10th the storm-center moved over Lake Superior, with pressure 29.30 at the morning report, the temperature rose 20° in eastern Ontario and the Saint Lawrence Valley, the rain area extended to the middle and south Atlantic coasts, and high south to west winds prevailed over the Great Lakes. Passing eastward, with a marked loss of energy, this low area disappeared east of Nova Scotia during the 13th.

VI.—Advanced from the north Pacific and was central north of Washington the evening of the 11th, with pressure below 29.60, heavy rain along the Pacific coast and over the northern plateau, heavy snow in the Sierra Nevada Mountains, and southerly gales in central and northern California. During the 12th the center of disturbance advanced rapidly southeastward to Nebraska, with pressure below 29.50, snow fell over the middle and northern plateau regions and the Northwest, and high west to northwest winds prevailed in the Missouri Valley and the middle and northern Rocky Mountain regions. By the evening of the 13th the center had reached southern Lake Michigan, the snow area had extended over the upper lakes, and a northeast gale prevailed over Lake Superior. During the 14th this low area passed to the region north of the upper Saint Lawrence river, and at the evening report a secondary storm appeared over Chesapeake Bay. On that date snow fell in the Lake region and Ohio Valley, and rain was

reported from Virginia to New York. The night of the 14th thunderstorms were noted in Connecticut. By the morning of the 15th the storm-center had advanced to the west Maine coast, with pressure 29.36 at Portland, and by the evening report it had passed to the west coast of the Gulf of Saint Lawrence, with pressure below 29.30. On that date snow was quickly followed by clearing weather in the middle Atlantic and New England states, thunderstorms occurred in Massachusetts in the early morning, and northwest gales prevailed along the middle Atlantic and New England coasts.

VII.—Apparently developed in the southeastern part of an area of low pressure which extended from the north Pacific coast over the southern plateau region, and the evening of the 15th was central near Santa Fe, N. Mex., with pressure below 29.90. During the 16th this low area advanced to southwestern Missouri, without evidence of marked energy, a second low area appeared over the west part of the Gulf of Mexico, rain fell in the middle and west Gulf states, heavy snow was noted in the upper Mississippi and Missouri valleys, and brisk southeast to southwest winds prevailed on the west Gulf coast. During the 17th the storm-center moved eastward over the Gulf and south Atlantic states, and was joined in the early morning by the low area from the Gulf of Mexico, rain was followed by clearing weather in the Gulf States, heavy rain fell along the south Atlantic coast, and thunderstorms were reported in Florida.

VIII.—The pressure was low on the north Pacific coast on the 17th and 18th, and on the 19th this low area was central north of Montana, with pressure below 29.70. During the 20th the storm-center advanced to Lake Superior, with pressure below 29.60, the temperature rose 10° to 20° in the Ohio valley and the Lake region, and rain and southerly gales prevailed over the middle and western Lake regions. On the 21st the center passed to the northern part of the Gulf of Saint Lawrence, and rain was followed by clearing weather in the middle Atlantic and New England states.

IX.—Apparently moved northward off the middle Pacific coast during the 20th, and the morning of the 21st was central near Roseburg, Oregon, with pressure 29.40, and rain generally along the Pacific coast. By the evening of the 21st this low area had advanced to the middle Rocky Mountain region, with pressure below 29.60. On that date rain fell from the Pacific coast over the plateau region. During the 22d the center of disturbance passed to south-central Kansas, with pressure 29.40, the temperature rose 20° in Missouri, rain fell in the Southwest and from the Ohio Valley to the middle Atlantic coast, snow was reported in the Northwest and thence over the Lake region and southern New England, and destructive windstorms were reported from Texas and Oklahoma to the western lake region.

On the 23d this low area moved northeastward over Iowa, with pressure below 29.40 at the evening report, the temperature rose 20° to 30° in the southwestern lake region and over the northern Ohio valley, rain or snow fell generally in the central valleys and thence to the Atlantic coast, and destructive local storms occurred from Louisiana and Mississippi over western Tennessee, western Kentucky, Indiana, and parts of the western lake region. During the 24th this low area passed northeastward over the upper lake region, with pressure 29.20 at the morning report, the temperature rose 20° along the middle Atlantic coast, snow fell in the upper Mississippi valley and the Lake region, rain was reported in the middle and south Atlantic states, and southwest to northwest gales prevailed over the Great Lakes. By the morning of the 25th the center of disturbance had passed over the north part of the Gulf of Saint Lawrence.

X.—Apparently developed over Texas on the 25th, and passed thence over the Gulf of Mexico during the 26th, with heavy rain and thunderstorms over the Florida Peninsula in



the evening. By the morning of the 27th the center had passed eastward over the Florida Peninsula, with a southwest gale over southern Florida.

XI.—Advanced from the north Pacific and the evening of the 28th occupied northern Alberta, with pressure below 29.60. By the evening of the 29th this low area had advanced to the Lake Superior region, with pressure below 29.40. On that date no precipitation was noted save at Lake Superior stations. During the 30th the center advanced to the lower Saint Lawrence valley, with light rain in New York and New England, and high westerly winds in the Lake region. By

the morning of the 31st the low area had disappeared east of Nova Scotia.

XII.—Advanced from the north Pacific and the morning of the 30th occupied Alberta, with pressure below 29.60. During the 30th this low area moved eastward north of Montana and North Dakota, with pressure below 29.40. During the 31st the low area increased in energy, and at the close of the month occupied Lake Superior with pressure below 29.30, and southerly gales over the western lake region. Very light precipitation at extreme north-central stations attended the passage of this low area on the 30th and 31st.

Tabulated statement showing principal characteristics of areas of high and low pressure.

Barometer.	First observed.			Last observed.			Duration.	Velocity per hour.	Maximum pressure change in 12 hours, maximum abnormal temperature change in 12 hours, and maximum wind velocity.											
	Date.	Lat. N.	Long. W.	Lat. N.	Long. W.				Station.	Rise.	Date.	Station.	Fall.	Date.	Station.	Direction.	Miles per hour.	Date.		
High areas.							Days.	Miles.		Inch.										
I.....	1	35	87	37	81	1.0	15		Norfolk, Va.....	.26	1	Knoxville, Tenn.....	10	3	Titusville, Fla.....	e.	35	2		
II.....	2	51	114	32	84	3.5	27		Wilmington, N. C.....	.70	4	Abilene, Tex.....	38	3	Kearney, Nebr.....	n.	40	3		
III.....	4	50	108	43	96	1.0	30		Huron, S. Dak.....	.16	5	Moorhead, Minn.....	22	5	Rapid City, S. Dak.....	n.	32	4		
IV.....	10	32	115	40	83	2.0	44		White River, Ont.....	.70	12	Grand Haven, Mich.....	20	11	Galveston, Tex.....	nw.	39	11		
V.....	12	52	115	40	74	4.5	20		Medicine Hat, N. W. T.....	.64	12	Rapid City, S. Dak.....	28	12	Valentine, Nebr.....	nw.	36	14		
VI.....	16	52	107	35	83	2.5	32		Abilene, Tex.....	.36	17	Abilene, Tex.....	18	17	Key West, Fla.....	ne.	36	19		
VII.....	18	43	102	43	72	1.5	43		Saint Paul, Minn.....	.22	19	Huron, S. Dak.....	17	19	Columbus, Ohio.....	nw.	36	19		
VIII.....	21	52	103	47	68	2.0	34		Father Point, Que.....	.68	22	Quebec, Que.....	24	22	Nantucket, Mass.....	ne.	48	23		
IX.....	23	51	105	42	75	5.5	17		Rockliffe, Ont.....	.54	25	Kansas City, Mo.....	27	23	Kearney, Nebr.....	nw.	36	24		
Mean.....							29			.47			23				36			
Low areas.										Fall.			Rise.							
I.....	1	38	105	47	77	2.0	35		Indianapolis, Ind.....	.34	2	Nashville, Tenn.....	16	2	Cleveland, Ohio.....	nw.	34	3		
II.....	3	34	94	36	73	1.0	50		Charlotte, N. C.....	.34	3	Shreveport, La.....	15	3	Kittyhawk, N. C.....	n.	60	4		
III.....	6	52	96	50	72	1.0	46		Qu'Appelle, N. W. T.....	.42	6	La Crosse, Wis.....	24	6	Buffalo, N. Y.....	n.	46	6		
IV.....	6	36	107	40	73	3.0	27		Chicago, Ill.....	.50	8	Little Rock, Ark.....	19	7	Chicago, Ill.....	se.	55	8		
V.....	7	53	120	44	67	5.5	23		Sault Ste. Marie, Mich.....	.58	11	Swift Current, N. W. T.....	24	7	Fort Canby, Wash.....	s.	60	7		
VI.....	11	51	121	48	65	4.0	35		Concordia, Kans.....	.64	12	Winnemucca, Nev.....	24	11	Fort Canby, Wash.....	nw.	60	10		
VII.....	15	37	107	34	74	2.0	43		Pueblo, Colo.....	.46	15	Pueblo, Colo.....	19	15	Amarillo, Tex.....	se.	50	15		
VIII.....	19	53	115	50	67	2.5	40		Alpena, Mich.....	.54	20	Calgary, N. W. T.....	34	19	Cleveland, Ohio.....	nw.	44	21		
IX.....	21	44	121	50	64	4.0	34		Father Point, Que.....	.60	24	Detroit, Mich.....	27	23	Amarillo, Tex.....	sw.	60	22		
X.....	25	32	99	30	79	1.5	39		Abilene, Tex.....	.22	25	San Antonio, Tex.....	12	25	Key West, Fla.....	sw.	50	27		
XI.....	28	54	113	46	60	2.5	42		Port Arthur, Ont.....	.70	29	Sioux City, Iowa.....	26	29	Chicago, Ill.....	nw.	48	30		
XII.....	30	52	113	48	88	1.5	32		Qu'Appelle, N. W. T.....	.58	30	Calgary, N. W. T.....	22	30	Buffalo, N. Y.....	sw.	48	30		
Mean.....							37			.49			22				52			

\*Pikes Peak, Colo., 85 miles w., 12th.

†Pikes Peak, Colo., 90 miles sw., 15th.

‡Pikes Peak, Colo., 82 miles sw., 31st.

## NORTH ATLANTIC STORMS FOR MARCH, 1893.

[Pressure in inches and millimeters; wind-force by Beaufort scale.]

The paths of storms that appeared over the west part of the north Atlantic Ocean during March, 1893, are shown on Chart I. These paths have been determined from reports of observations by shipmasters received through the co-operation of the Hydrographic Office, Navy Department, and the "New York Herald Weather Service."

Over the north Atlantic Ocean the March normal pressure is highest in a belt reaching from the northwest coast of Africa to the Florida and south Atlantic coasts, where it is above 30.10 (764). The March normal pressure is lowest in an area extending from southern Greenland over Iceland, where it is below 29.70 (754).

In March there is usually an increase of pressure from the Azores over the British Isles, Iceland, and Greenland. The greatest increase of pressure occurs over mid-ocean north of the 50th parallel, where it amounts to more than .15 inch. Over the western part of the ocean there is usually a decrease of pressure. The most marked decrease of pressure is shown over the Canadian Maritime Provinces and along the New England coast, where the normal pressure is about .10 inch lower than for February.

The north Atlantic storms for March have an average velocity of about 22 statute miles per hour, and an average of

about 2 storms traverse the ocean from coast to coast. The storms of that month usually pass from the Nova Scotia or New England coasts to the region northeast of the Banks of Newfoundland, where the principal track divides, one branch passing to Iceland and thence to the north coast of Norway. The other branch crosses the ocean to the region west of the British Isles, where it divides, one class of storms moving over or north of Scotland, and the other over the Bay of Biscay. A limited number of storms appear over the Gulf of Mexico and pass thence northeastward to Newfoundland or the Grand Banks.

In March, 1893, two storms, low areas IX and X, traversed the ocean from the American coast to European waters. With the exception of low areas II and VII, which passed off the south Atlantic coast the morning of the 4th and the evening of the 17th, respectively, the storms of the western part of the ocean possessed small energy. Over mid-ocean the only severe storms of the month prevailed on the 2d, 21st, and 22d. Over the eastern part of the ocean generally settled weather prevailed during the first and third decades of the month.

The month opened with low barometric pressure from coast to coast. An area of low pressure occupied the ocean south

of New England and Nova Scotia, a storm of considerable strength was central between the Azores and the Banks of Newfoundland, the pressure was low north and northwest of the British Isles, and west to north gales of force 10 to 11 were encountered west of the 50th meridian. By the 2d the storm over the western part of the ocean had advanced to the Grand Banks, and the storm which occupied mid-ocean had moved northward, with pressure falling below 29.00 (736) and northwesterly gales of force 8 to 9. By the 3d these storms had disappeared north of the region of observation. The severest storms of the month over the western part of the ocean attended the passage of low area II from the North Carolina coast to the Banks of Newfoundland during the 4th and 5th. The morning of the 4th this storm was central off the North Carolina coast, with pressure below 29.20 (742). During that date the storm-center moved slowly northeastward, with pressure below 28.80 (731), and northwesterly gales of hurricane force west of the 65th meridian, and by the morning of the 5th had crossed the trans-Atlantic steamship routes and reached the Banks of Newfoundland without an apparent loss of energy. By the morning of the 6th this disturbance had disappeared north of the Banks of Newfoundland. The afternoon of the 9th low area IV moved off the New Jersey coast. During the 10th this storm moved southeastward in the direction of Bermuda, its passage being unattended by noteworthy features.

From the 11th to the 16th the pressure continued low over and near the British Isles. A barometric depression apparently occupied the ocean west of the British Isles from the 11th to the 14th, passed over Great Britain during the 15th, and reached the North Sea by the 16th. During the 13th and 14th low area V occupied the ocean south of Nova Scotia. The morning of the 15th low area VI was central on the New England coast, with pressure below 29.40 (747), and during that date passed northeastward over New Brunswick, with pressure falling below 29.30 (744), and west to north gales of force 8 to 10 west of the 65th meridian. During the 16th this storm disappeared north of Newfoundland. During the 17th low area VII passed off the south Atlantic coast, and the morning of the 18th was central about midway between Bermuda and Nova Scotia.

During the 18th the storm-center moved northeastward over the trans-Atlantic steamship routes, with pressure below 29.00 (736) and gales of hurricane force, and during the 19th passed over the Banks of Newfoundland, with an apparent loss of energy. From the 20th to the 25th this storm occupied mid-ocean, and on the 21st and 22d was attended by gales of hurricane force north of the Azores. By the 26th the center of disturbance had apparently passed southeast of the Azores. On the 25th low area IX passed eastward over northern Newfoundland. During the 26th and 27th this

storm moved southeastward over mid-ocean, and by the 28th had disappeared in the direction of the Spanish Peninsula. The night of the 26th low area X advanced from the Gulf of Mexico over the Florida Peninsula, passed thence northeastward over the Grand Banks by the morning of the 29th, and thence eastward to the British Isles by the close of the month.

#### OCEAN ICE IN MARCH.

The following table shows the southern and eastern limits of the region within which icebergs or field ice were reported for March during the last 12 years:

Southern limit.			Eastern limit.		
Month.	Lat. N.	Long. W.	Month.	Lat. N.	Long. W.
March, 1882.....	42 30	50 00	March, 1882.....	46 30	46 00
March, 1883.....	41 46	49 48	March, 1883.....	48 40	43 03
March, 1884.....	41 20	54 06	March, 1884.....	45 00	40 15
March, 1885.....	40 55	49 04	March, 1885.....	45 57	43 15
March, 1886.....	40 20	49 02	March, 1886.....	47 20	44 40
March, 1887.....	41 00	49 07	March, 1887.....	45 31	42 56
March, 1888.....	42 30	50 37	March, 1888.....	47 23	46 56
March, 1889.....	44 20	53 00	March, 1889.....	44 20	53 00
March, 1890.....	41 01	50 54	March, 1890.....	46 40	39 50
March, 1891.....	42 25	50 30	March, 1891.....	49 00	43 44
March, 1892.....	43 58	48 15	March, 1892.....	43 58	48 15
March, 1893.....	44 35	50 13	March, 1893.....	45 55	46 56
Mean.....	42 14	50 23	Mean.....	46 22	44 55

The limits of the region within which icebergs or field ice were reported for March, 1893, are shown on Chart I by ruled shading. The southernmost ice reported, a small, rounded iceberg, noted on the 30th, was about 2½° north of the average southern limit, and the easternmost ice observed, a lump of ice noted on the 17th in the position given in the table, was about 2° west of the average eastern limit of ice for March. Icebergs were reported near the east edge of the Banks of Newfoundland on the 2d, 27th, and 30th. Field ice was encountered over or near the northeastern part of the Grand Banks on the 9th, 13th, 17th, 18th, 19th, 28th, and 29th. Field ice was noted near Cape Breton Island and eastern Nova Scotia on the 5th, 8th, 19th, 22d, 24th, and 30th.

#### OCEAN FOG FOR MARCH.

The limits of fog belts west of the 40th meridian, as reported by shipmasters, are shown on Chart I by dotted shading. East of the 55th meridian fog was reported on 7 dates; between the 55th and 65th meridians on 10 dates; and west of the 65th meridian on 8 dates. Compared with the corresponding month of the last 5 years the dates of occurrence of fog east of the 55th meridian numbered 2 greater than usual; and west of the 55th meridian 3 greater than usual. The fog reported was generally noted in the east quadrants of general storms.

#### TEMPERATURE OF THE AIR (expressed in degrees Fahrenheit).

The distribution of mean temperature over the United States and Canada for March, 1893, is exhibited on Chart II by dotted isotherms. In the table of miscellaneous meteorological data the monthly mean temperature and the departure from the normal are given for regular stations of the Weather Bureau. The figures opposite the names of the geographical districts in the columns for mean temperature and departure from the normal show, respectively, the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the temperature is below the normal and subtracting when above. The monthly mean temperature for regular stations of the Weather Bureau represents the mean of the maximum and minimum temperatures.

The mean temperature was highest over the extreme southern part of the Florida Peninsula, where it was above 70. The mean temperature was above 60 over the entire Florida Peninsula, along the middle Gulf coast, in Texas south of the 30th parallel, and in the Gila and lower Colorado valleys. The mean temperature was lowest in the British Northwest Territory north of North Dakota and eastern Montana, where it was below 10. In the mountains of central Colorado the mean values were below 20. In central and northern New England, and north of a line traced from east-central New York over the southern lake region and the extreme upper Mississippi valley to northeastern Wyoming, thence to north-central New Mexico, and thence irregularly northwestward to northwestern Montana the mean temperature was below 30.



The mean readings were also below 30 at stations in the Sierra Nevada Mountains between the 38th and 40th parallels.

#### DEPARTURE FROM NORMAL TEMPERATURE.

The mean temperature was below the normal, except in parts of the Ohio and Saint Lawrence valleys and the Lake region, and at Key West, Fla. The most marked departure below the normal was noted in northeastern Montana and the British Possessions to the northward, where the month was 10 or more colder than usual. The departure below the normal was more than 4 from western Colorado over the northeast slope of the Rocky Mountains, in the middle and upper Missouri, extreme upper Mississippi, and Red River of the North valleys, and in an area covering the interior of southern California. The greatest departure above the normal temperature was noted in Ontario and western Quebec, where the month was 2 to 3 warmer than usual.

The following table shows for certain stations, as reported by voluntary observers, (1) the normal temperature for March for a series of years; (2) the length of record during which the observations have been taken, and from which the normal has been computed; (3) the mean temperature for March, 1893; (4) the departure of the current month from the normal; (5) and the extreme monthly mean for March during the period of observation and the years of occurrence:

State and station.	(1) Normal for the month of March.	(2) Length of record.	(3) Mean for March, 1893.	(4) Departure from normal.	(5) Extreme monthly mean for March.			
					Highest.	Year.	Lowest.	Year.
<i>Arizona.</i>	°	Years	°	°	°		°	
Fort Apache .....	46.1	21	43.4	- 2.7	53.8	1879	41.3	1875
Fort Mohave .....	63.7	22	60.6	- 3.1	70.5	1879	58.0	1886
Whipple Barracks .....	45.6	21	41.4	- 4.2	53.6	1879	38.7	1886
<i>Arkansas.</i>								
Keesees Ferry .....	47.8	11	47.0	- 0.8	55.4	1882	45.0	1891
<i>California.</i>								
Fort Bidwell .....	40.4	22	35.1	- 5.3	49.3	1883	31.2	1874
Riverside .....	56.6	11	51.5	- 5.1	61.6	1885	51.5	1893
<i>Colorado.</i>								
Las Animas .....	40.0	11	39.8	- 0.2	45.4	1887	33.2	1891
<i>Florida.</i>								
Merritts Island .....	66.0	11	66.6	+ 0.6	71.4	1882	61.6	1889
<i>Georgia.</i>								
Forsyth .....	56.6	19	57.8	+ 1.2	61.7	1880, '82	51.4	1885
<i>Idaho.</i>								
Boise Barracks .....	43.2	19	38.7	- 4.5	49.1	1889	36.8	1882
Fort Sherman .....	38.6	9	34.2	- 4.4	43.6	1889	33.2	1882
<i>Indiana.</i>								
Lafayette .....	35.8	13	38.3	+ 2.5	41.3	1882	29.6	1885
<i>Indian Territory.</i>								
Fort Supply .....	44.7	14	47.4	+ 2.7	53.6	1882	37.4	1876
<i>Iowa.</i>								
Cresco .....	25.2	21	25.3	+ 0.1	42.3	1878	19.6	1888
<i>Kansas.</i>								
Eureka Ranch .....	40.3	10	38.6	- 1.7	46.0	1889	34.1	1891
Independence .....	44.5	21	44.9	+ 0.4	54.1	1878	36.7	1876
Salina .....	40.0	10	.....	.....	45.0	1889	34.3	1891
<i>Louisiana.</i>								
Grand Coteau .....	61.2	10	59.5	- 1.7	66.2	1884	57.6	1892
<i>Maine.</i>								
Orono .....	27.5	23	.....	.....	34.6	1871	19.1	1885
<i>Maryland.</i>								
Cumberland .....	37.0	22	39.2	+ 2.2	46.0	1878	30.0	1875
<i>Michigan.</i>								
Kalamazoo .....	31.2	17	33.5	+ 2.3	42.2	1878	22.5	1885
<i>Missouri.</i>								
Sedalia .....	41.4	10	40.7	- 0.7	48.1	1889	36.1	1891
<i>Montana.</i>								
Fort Custer .....	32.7	11	29.9	- 2.8	40.8	1889	23.0	1888
<i>Nebraska.</i>								
Fort Robinson .....	34.2	9	32.6	- 1.6	43.0	1889	24.8	1891
Genoa (near) .....	32.2	17	29.7	- 2.5	43.6	1878	23.8	1876
<i>Nevada.</i>								
Browns .....	46.8	21	44.1	- 2.7	52.8	1879	37.7	1880
Carson City .....	41.4	16	39.5	- 1.9	50.1	1877	33.5	1880
<i>New Hampshire.</i>								
Hanover .....	27.8	22	27.2	- 0.6	35.5	1871	19.0	1872, 1875
<i>New Mexico.</i>								
Fort Wingate .....	43.1	22	38.3	- 3.8	51.1	1879	34.3	1886
<i>New York.</i>								
Cooperstown .....	27.3	22	28.5	+ 1.2	37.2	1871	18.3	1885
Plattsburg Barracks .....	26.7	22	24.8	- 1.9	35.0	1871	16.7	1885
<i>North Carolina.</i>								
Lenoir .....	45.4	19	46.8	+ 1.4	51.6	1878	35.0	1877
<i>Oklahoma.</i>								
Fort Reno .....	48.2	9	48.8	+ 0.6	52.8	1887	45.5	1891
Fort Sill .....	51.1	21	49.8	- 1.3	59.3	1879	42.0	1876
<i>Oregon.</i>								
Bandon .....	46.8	9	46.7	- 0.1	50.8	1889	41.5	1886

#### Departures from normal temperature—Continued.

State and station.	(1) Normal for the month of March.	(2) Length of record.	(3) Mean for March, 1893.	(4) Departure from normal.	(5) Extreme monthly mean for March.			
					Highest.	Year.	Lowest.	Year.
<i>Pennsylvania.</i>	°	Years	°	°	°		°	
Dyberry .....	28.6	22	28.6	0.0	36.9	1878	19.5	1885
Grampian .....	30.4	22	32.0	+ 1.6	40.4	1878	20.1	1885
Wellsboro .....	30.6	13	29.1	- 1.5	37.6	1882	22.4	1885
<i>South Carolina.</i>								
Statesburg .....	52.6	12	53.3	+ 0.7	59.0	1882	48.3	1885
<i>South Dakota.</i>								
Fort Sully .....	29.2	22	26.6	- 2.6	44.5	1878	15.9	1876
<i>Texas.</i>								
Austin .....	60.4	21	59.6	- 0.8	66.8	1879	53.0	1872
Silver Falls .....	51.4	7	53.9	+ 2.5	56.7	1887	47.7	1891
<i>Utah.</i>								
Terrace .....	42.3	21	35.2	- 7.1	51.3	1889	28.3	1875
<i>Vermont.</i>								
Stratford .....	26.0	20	25.2	- 0.8	33.8	1878	17.2	1883
<i>Virginia.</i>								
Dale Enterprise .....	41.5	13	41.8	+ 0.3	47.1	1880	32.1	1885
<i>Washington.</i>								
Fort Townsend .....	44.6	20	43.0	- 1.6	50.7	1885	38.7	1880
<i>West Virginia.</i>								
Parkersburg .....	41.7	11	42.0	+ 0.3	52.8	1882	36.7	1890
<i>Wisconsin.</i>								
Embarrass .....	26.0	21	.....	.....	42.3	1878	19.2	1872
Madison .....	29.3	22	28.7	- 0.6	43.9	1878	23.2	1888
<i>Wyoming.</i>								
Fort Washakie .....	35.4	10	30.1	- 5.3	41.0	1887	26.8	1891

#### TEMPERATURE, JANUARY TO MARCH.

For the period January 1 to March 31, 1893, the mean temperature averaged 2 to 4 below the normal in the New England, middle and south Atlantic, and east Gulf states, at Key West, Fla., in the Ohio Valley and Tennessee, the Lake region, the upper Mississippi and Missouri valleys, on the middle-eastern slope of the Rocky Mountains, over the middle and northern plateau regions, and along the middle and north Pacific coasts, and was about 1 below the normal on the northeast slope of the Rocky Mountains. In the extreme northwest and on the southeast slope of the Rocky Mountains the mean temperature was about 1 above the normal. In the west Gulf states, over the southern plateau region, and along the south Pacific coast the mean temperature averaged about normal for the period named.

#### YEARS OF HIGHEST MEAN TEMPERATURE FOR MARCH.

The highest mean temperature for March was noted in Washington and Oregon, along the immediate middle Pacific coast, and in the extreme northwest in 1889; over northern and western Florida and southern Georgia in 1880; from the east part of the middle plateau region over the west Gulf states in 1879; from the middle-eastern slope of the Rocky Mountains over the Lake region to the Atlantic coast north of Georgia in 1878, except in Pennsylvania, where the highest mean was noted in 1871.

#### YEARS OF LOWEST MEAN TEMPERATURE FOR MARCH

At Havre, Mont., and Red Bluff and Riverside, Cal., the mean temperature for the current month was the lowest reported for March during the respective periods of observation. The lowest mean temperature for March was noted at points in the interior of the middle Gulf states and along the Texas coast in 1892; from the middle-eastern slope of the Rocky Mountains and the lower Missouri valley over the greater part of Texas in 1891; from the northeast slope of the Rocky Mountains to the extreme upper Mississippi valley in 1888; from the east Gulf coast over the central and eastern lake regions and New England in 1885, except at stations on the immediate New England coast; along the Pacific coast in 1880; in the middle Mississippi valley, and at points on the New England, New York, and south Atlantic coasts in 1872.

## MAXIMUM TEMPERATURE.

At Columbus and Cincinnati, Ohio, Springfield, Mo., Concordia, Kans., and Helena, Mont., the maximum temperature for the current month was the highest ever noted for March.

The highest temperature reported by a regular station of the Weather Bureau in March, 1893, was 97, at Yuma, Ariz., on the 28th. The maximum temperature reached 92 at Tucson, Ariz., on two or more dates, and a reading of 90 was noted at Abilene, Tex., on the 31st. In the Gulf States, except along the middle Gulf coast, the maximum temperature was above 80. Maximum temperature above 80 was also reported in Florida, central and southern Georgia, the interior of South Carolina, from the lower Missouri valley and the middle-eastern slope of the Rocky Mountains to the Rio Grande River, over south and west parts of the southern plateau region, and over the southern half of California, except in the Sierra Nevada Mountain districts and on the southern coast. Reports of voluntary observers show maximum temperature above 100 in the lower Colorado valley, Arizona, and in the Colorado Desert, California. The lowest maximum temperature, 41, was noted at Moorhead, Minn.; the maximum values were below 50 in the Lake Superior region and the Red River of the North Valley, and were below 55 on the southeast New England and extreme north Pacific coasts.

## MINIMUM TEMPERATURE.

At Savannah and Atlanta, Ga., Chattanooga, Tenn., Cairo, Ill., and Little Rock, Ark., the minimum temperature was as low, and at Charlotte, N. C., Memphis, Tenn., Fort Smith, Ark., Moorhead, Minn., and Los Angeles, Cal., it was lower than previously reported for March.

The lowest temperature reported by a regular station of the Weather Bureau, 26 below zero, was noted at Saint Vincent, Minn., on the 4th and 15th. In the Red River of the North Valley and over the eastern half of North Dakota the minimum temperature fell below -20, and the minimum values were below zero over the northern lake region, in the middle and upper Missouri and extreme upper Mississippi valleys, and on the middle and northeast slopes of the Rocky Mountains. The minimum temperature was also below zero over northern New England. The highest minimum temperature, 56, was noted at Key West, Fla.; the minimum readings were 40, or above, over the southern part of the Florida Peninsula, along the immediate middle and west Gulf coasts, and at San Francisco and San Diego, Cal.

## LIMITS OF FREEZING WEATHER.

The southern limit of freezing weather is shown on Chart V by a line traced southwestward over the Florida Peninsula to Tampa, Fla., and from the middle Gulf coast westward over Texas north of San Antonio. The western limit of freezing weather is shown by a line traced along the immediate north Pacific coast to extreme northwestern California, and thence over the central valleys of California, extreme southern Nevada, and western Arizona.

## PRECIPITATION (expressed in inches and hundredths).

The distribution of precipitation over the United States and Canada for March, 1893, as determined from reports of more than 2,000 stations, is exhibited on Chart III. In the table of miscellaneous meteorological data the total precipitation and the departure from the normal are given for regular stations of the Weather Bureau. The figures opposite the names of the geographical districts in the columns for precipitation and departure from the normal show, respectively, the averages for the several districts. The normal for any district

## RANGES OF TEMPERATURE.

The greatest daily range of temperature is shown in the table of miscellaneous meteorological data. The greatest monthly range of temperature, 93, was noted at North Platte, Nebr., and the range exceeded 80 along the middle-eastern and northeastern slopes of the Rocky Mountains. From the middle and northern Rocky Mountain regions the monthly ranges decreased eastward to less than 40 on the south New England coast, and to 40 at Hatteras, N. C., southeastward to less than 30 at Key West, Fla., and Port Eads, La., southwestward to less than 40 on the extreme south Pacific coast, and westward to less than 30 on the immediate north Pacific coast.

## COLD WAVES.

A severe cold wave overspread the Southwest on the 3d, and extended to the south Atlantic coast on the 4th, with a fall in temperature of 30 to 40 in the Gulf and south Atlantic states, freezing weather to Charleston, S. C., Montgomery, Ala., and Meridian, Miss., and the lowest temperature on record for March at points in Tennessee and Arkansas. The morning of the 5th the temperature fell below the freezing point over the northern part of the Florida Peninsula, and reached 32 at New Orleans, La. The second important cold wave of the month appeared over the Rocky Mountain regions on the 12th, overspread the Missouri Valley on the 13th with a fall in temperature of 30 to 40, extended over the middle and upper Mississippi valleys, and from the western lake region to the northern part of the east Gulf states on the 14th, and reached the Atlantic coast on the 15th, with freezing weather to the north part of the east Gulf states. The morning of the 16th the temperature fell to 31 at Wilmington, N. C. From the 21st to the 23d a cold wave swept over the northern part of the country from the eastern Saskatchewan valley to the New England coast. From the 23d to the 25th a moderate cold wave advanced from the Western States over the central valleys.

## FROST.

On the 5th frost occurred generally over the northern part of the Florida Peninsula. At Tampa, Fla., the temperature fell to 31.9, and frost damaged young fruit and vegetables. At Titusville, Fla., the temperature fell to 34 and frost damaged tender vegetation. At Pensacola, Fla., the temperature fell to 28, and garden vegetables in that section were killed by frost. On the 6th heavy frost was reported at Montgomery, Ala., and light frost at Savannah, Ga., and Charleston, S. C. Light frost occurred in southern Arizona on the 10th. On the 18th frost killed fruit blooms about Dallas, Tex. On the 19th low temperature and heavy frost damaged tender vegetation in the east Gulf and south Atlantic states. Tender plants in North Carolina were nipped by frost on the 20th. On the 29th light frost was reported in northern Louisiana, and peach blossoms were injured in northern Arkansas. Light frost was noted at points in the interior of the Gulf and south Atlantic states the morning of the 30th.

may be found by adding the departure to the current mean when the precipitation is below the normal and subtracting when above.

In March the normal precipitation is greatest at points along the Pacific coast north of the 42d parallel and at stations in the Sierra Nevada Mountains between the 37th and the 40th parallels, where it exceeds 8.00. It exceeds 6.00 over a great part of the Gulf States east of the 95th meridian and in southeastern Tennessee and western parts of the Carolinas



and Georgia. Along the Atlantic coast north of the 34th parallel, from Kentucky and Arkansas to the Florida Peninsula and eastern Texas, in areas in north-central Colorado and central Utah, and generally west of the Sierra Nevada Mountains, the normal amount is in excess of 4.00. In districts east of a line traced from northern Lower Michigan to south-central Texas the precipitation in March usually exceeds 2.00. Generally over the Rocky Mountain and plateau regions the March precipitation is less than 1.00, and in large areas in those districts it is less than 0.50.

In March, 1893, the monthly precipitation was 21.54 at Pikes Peak, Colo., 17.69 at Georgetown, Cal., and 14.83 at Neah Bay, Wash., and exceeded 10.00 at points along the immediate north Pacific coast, in northwestern California, in the Sierra Nevada Mountains between the 37th and 40th parallels, and in the mountain region east of Los Angeles, Cal. The monthly amount exceeded 8.00 generally along the immediate Pacific coast, in east-central California, and over the northern part of the Florida Peninsula. In areas in the central valleys and the Gulf and south Atlantic states, along the south New England and New Jersey coasts, and in eastern Pennsylvania and south-central Nevada 4.00, or more, fell. In the Saskatchewan Valley, western and northeastern Montana, and northwestern North Dakota, over the middle and southern Rocky Mountain regions, in the lower Rio Grande valley, and at Key West, Fla., the precipitation was less than 0.25. Over the west part of the plateau region, generally in the Rocky Mountain districts, from northern North Dakota over northern Lake Superior, in northeastern New York, northern Vermont, northern New Hampshire, southern Texas, and extreme southern Florida, the monthly precipitation was less than 1.00.

#### DEPARTURE FROM NORMAL PRECIPITATION.

The monthly precipitation was in excess of the normal amount for March along the middle and south New England and New Jersey coasts, in Florida, except over the extreme southern portion, generally over the Pacific coast and plateau regions, except in Oregon, in the western and northern lake regions, and thence to the middle Rocky Mountain districts; elsewhere the monthly precipitation was deficient when compared with the average amount for March. The greatest amount in excess of the normal, 6.80, was noted at Neah Bay, Wash. At Jacksonville, Fla., and Los Angeles, Cal., the excess was 5.00 to 6.00. Over northeastern Florida, northwestern Washington, and extreme northwestern and southwestern California, the precipitation was more than 4.00 greater than usual. The most marked deficiency, 3.00 to 4.00, was noted over eastern Maine, parts of Nova Scotia, and in an area extending from Mississippi and southwestern Tennessee over the interior of the east Gulf and south Atlantic states, western North Carolina, and southwestern Virginia. In the lower valley of the Columbia River, Oregon, from the middle and west Gulf coasts over the interior of the middle and east Gulf and south Atlantic states, Virginia, District of Columbia, and Maryland, and over northern New England, New Brunswick, and Nova Scotia, the monthly precipitation was 2.00 or more less than the normal amount for March.

Considered by districts the average percentage of the normal in districts where the monthly precipitation was in excess was about as follows: south Pacific coast, 317; extreme northwest, 200; southern plateau region, 183; middle Pacific coast, 153; northern plateau region, 148; middle plateau region, 146; Missouri Valley, 138; north Pacific coast, 126; upper Mississippi valley, 118. In districts where the precipitation was deficient the percentage of the normal was about as follows: middle-eastern and southeastern slopes of the Rocky Mountains, 26; Ohio Valley and Tennessee, 52; east Gulf states, 55; lower lake region, 63; west Gulf states, 64; mid-

dle Atlantic states, 67; south Atlantic states, 80. In New England, the upper lake region, and on the northeast slope of the Rocky Mountains the monthly precipitation averaged about normal.

The following table shows for certain stations, as reported by voluntary observers, (1) the average precipitation for March for a series of years; (2) the length of record during which the observations have been taken and from which the average has been computed; (3) the total precipitation for March, 1893; (4) the departure of the current month from the average; (5) and the extremes for March during the period of observation and the years of occurrence:

State and station.	(1) Average for the month of March.	(2) Length of record.	(3) Total for March, 1893.	(4) Departure from average.	(5) Extremes for March.			
					Greatest.		Least.	
					Am't.	Year.	Am't.	Year.
<i>Arizona.</i>	<i>Inches.</i>	<i>Years.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>		<i>Inches.</i>	
Fort Apache .....	1.63	17	2.45	+ 0.82	4.44	1884	0.03	1879
Fort Mohave .....	0.45	22	1.09	+ 0.64	2.50	1889	0.00	
Whipple Barracks .....	1.43	21	3.26	+ 1.83	5.51	1884	0.00	1882
<i>Arkansas.</i>								
Keeseee Ferry .....	3.85	11	3.75	- 0.10	6.78	1890	2.78	1892
<i>California.</i>								
Fort Bidwell .....	2.06	22	1.60	- 0.46	7.31	1889	0.04	1885
Riverside .....	2.04	12	5.74	+ 3.70	8.52	1886	0.00	1888
<i>Colorado.</i>								
Las Animas .....	0.75	11	0.05	- 0.70	2.43	1891	0.00	1890
<i>Florida.</i>								
Merritts Island .....	2.55	15	2.95	+ 0.40	7.92	1878	0.56	1892
<i>Georgia.</i>								
Forsyth .....	7.42	19	2.51	- 4.91	12.87	1875	1.37	1878
<i>Idaho.</i>								
Boise Barracks .....	1.72	19	1.30	- 0.42	7.66	1871	0.03	1885
Fort Sherman .....	1.86	10	3.35	+ 1.49	3.35	1893	0.14	1882
<i>Indiana.</i>								
Lafayette .....	2.59	13	4.12	+ 1.53	4.25	1886	0.46	1885
<i>Indian Territory.</i>								
Fort Supply .....	1.55	14	0.20	- 1.35	7.62	1876	0.00	1887, 1890
<i>Iowa.</i>								
Cresco .....	1.77	20	2.77	+ 1.00	4.55	1888	0.22	1889
<i>Kansas.</i>								
Independence .....	2.17	21	2.98	+ 0.81	5.54	1892	0.43	1872
Salina .....	1.02	10	.....	.....	3.28	1892	0.03	1885
<i>Louisiana.</i>								
Grand Coteau .....	4.81	10	3.83	- 0.98	10.20	1884	0.80	1891
<i>Maine.</i>								
Orono .....	4.27	23	.....	.....	8.20	1876	1.89	1883
<i>Maryland.</i>								
Cumberland .....	3.09	21	1.00	- 2.09	7.47	1891	0.50	1872
<i>Michigan.</i>								
Kalamazoo .....	2.39	17	2.89	+ 0.50	7.33	1877	0.42	1883
<i>Missouri.</i>								
Sedalia .....	2.60	15	2.67	+ 0.07	7.67	1888	0.43	1879
<i>Montana.</i>								
Fort Custer .....	0.54	13	0.35	- 0.19	1.19	1887	0.07	1882
<i>Nebraska.</i>								
Fort Robinson .....	1.16	9	1.19	+ 0.03	1.83	1888	T.	1889
Genoa (near) .....	1.25	17	1.72	+ 0.47	3.55	1876	T.	1882
<i>Nevada.</i>								
Browns .....	0.35	21	0.25	- 0.10	2.00	1883	0.00	*
Carson City .....	1.45	16	1.47	+ 0.02	4.22	1882	0.18	1875
<i>New Hampshire.</i>								
Hanover .....	2.33	22	2.12	- 0.21	5.25	1888	0.28	1878
<i>New Mexico.</i>								
Fort Wingate .....	1.05	22	1.11	+ 0.06	2.70	1890	0.02	1887
<i>New York.</i>								
Cooperstown .....	2.89	22	2.13	- 0.76	5.20	1871	0.55	1885
Plattsburg Barracks .....	2.05	22	0.68	- 1.37	3.68	1873	0.08	1889
<i>North Carolina.</i>								
Lenoir .....	4.17	21	1.10	- 3.07	10.20	1875	0.50	1879
<i>Oklahoma.</i>								
Fort Reno .....	1.65	10	1.90	+ 0.25	3.10	1892	0.00	1886
Fort Sill .....	1.51	21	1.36	- 0.15	4.52	1871	0.03	1872
<i>Oregon.</i>								
Bandon .....	6.78	15	10.84	+ 4.06	15.50	1879	0.63	1885
<i>Pennsylvania.</i>								
Dyberry .....	3.11	22	3.30	+ 0.19	5.00	1890	1.03	1885
Grampian .....	3.94	22	2.49	- 1.45	6.89	1875	1.34	1885
Wellsboro .....	4.93	13	5.09	+ 0.16	10.08	1884	0.66	1887
<i>South Carolina.</i>								
Statesburg .....	4.14	12	1.32	- 2.82	7.62	1891	0.97	1887
<i>South Dakota.</i>								
Fort Sully .....	1.04	22	2.80	+ 1.76	9.60	1871	T.	1887
<i>Texas.</i>								
Austin .....	2.47	21	2.90	+ 0.43	5.60	1876	0.58	1890
Silver Falls .....	0.54	5	0.93	+ 0.39	1.03	1892	0.00	1889
<i>Utah.</i>								
Terrace .....	0.41	20	0.55	+ 0.14	1.74	1884	0.00	*
<i>Vermont.</i>								
Stratford .....	3.54	20	1.90	- 1.64	4.10	1876	1.50	1892
<i>Virginia.</i>								
Dale Enterprise .....	3.56	13	1.39	- 2.17	6.86	1886	1.01	1881
<i>Washington.</i>								
Fort Townsend .....	1.79	17	2.26	+ 0.47	4.32	1876	0.11	1884
<i>West Virginia.</i>								
Parkersburg .....	3.21	7	0.94	- 2.27	6.95	1890	0.80	1885
<i>Wisconsin.</i>								
Embarrass .....	2.48	22	.....	.....	5.46	1871	0.55	1883

## Departures from average precipitation—Continued.

State and station.	(1) Average for the month of March.	(2) Length of record.	(3) Total for March, 1893.	(4) Departure from average.	(5) Extremes for March.			
					Greatest.		Least.	
					Am't.	Year.	Am't.	Year.
Wisconsin—Continued.	Inches.	Years.	Inches.	Inches.	Inches.		Inches.	
Madison .....	2.61	22	2.28	— 0.33	4.73	1882	0.30	1883
Wyoming.								
Fort Washakie .....	0.70	10	0.26	— 0.44	2.52	1891	0.06	1889

\*Frequently.

## PRECIPITATION, JANUARY TO MARCH

For the period January to March, 1893, inclusive, the precipitation averaged about the normal amount in New England, the upper lake region, the Missouri Valley, on the northeast slope of the Rocky Mountains, over the northern plateau region, and along the middle and north Pacific coasts. In the extreme northwest, over the middle plateau region, and along the south Pacific coast the precipitation was about one-half greater, and over the southern plateau region it was about one-tenth greater than usual. In the west Gulf states and on the middle-eastern slope of the Rocky Mountains one-fourth to one-half, and in the middle and south Atlantic and east Gulf states, in the Ohio Valley and Tennessee, the lower lake region, the upper Mississippi valley, and on the southeast slope of the Rocky Mountains six-tenths to nine-tenths of the usual amount of precipitation was reported.

## YEARS OF GREATEST PRECIPITATION FOR MARCH.

At Jacksonville, Fla., Fort Sherman, Idaho, and Neah Bay, Wash., the precipitation for the current month was the greatest reported for March during the respective periods of observation.

The greatest precipitation for March was noted at Montgomery, Ala., and Santa Fe, N. Mex., in 1892; at Washington, D. C., Charlotte, N. C., Nashville, Tenn., Marquette, Mich., Duluth, Minn., North Platte, Nebr., Denver, Colo., Salt Lake City, Utah, and Helena, Mont., in 1891; in the middle Ohio valley in 1890; in Virginia, Arizona, southern California, and the Sacramento Valley in 1884; in Minnesota and northwestern Wisconsin in 1882; in the lower Rio Grande valley in 1878; in the middle and lower Mississippi, lower Ohio, and lower Missouri valleys in 1876; over western New York in 1873; and along the South Carolina and Georgia coasts in 1872.

## YEARS OF LEAST PRECIPITATION FOR MARCH.

At Eastport, Me., Baltimore, Md., Key West, Fla., Galveston, Tex., and Memphis, Tenn., the precipitation for the current month was the least reported for March during the respective periods of observation.

The least precipitation for March was noted at Jacksonville, Fla., in 1892; in South Carolina, Georgia, and eastern Alabama in 1887; generally in the middle Atlantic and south New England states, in the Ohio, upper Mississippi, and lower Missouri valleys, and in the Pacific coast states and Nevada in 1885; on the eastern slope of the Rocky Mountains from Colorado and northwestern Kansas to southern Montana, and in the middle Missouri valley in 1882; and from eastern Texas over the greater part of Louisiana, Mississippi, central Tennessee, and western Kentucky in 1879.

## EXCESSIVE PRECIPITATION.

The following tables show, by states, the number of stations reporting monthly precipitation to equal or exceed 10.00; precipitation to equal or exceed 2.50 in 24 hours;

and precipitation to equal or exceed 1.00 in 1 hour in March, 1893:

## Monthly precipitation to equal or exceed 10.00.

State.	Number of stations.	State.	Number of stations.
California.....	35	Oregon .....	3
Washington.....	4		

## Precipitation to equal or exceed 2.50 in 24 hours.

State.	Number of stations.	Dates.	State.	Number of stations.	Dates.
California.....	24	4-5, 7-8, 8, 9-10, 10, 10-11, 18-21, 19-20, 20, 20-21, 21.	Mississippi.....	2	17, 23.
Louisiana.....	12	15-16, 16, 16-17, 17, 20.	South Dakota....	2	8, 12-13.
Georgia.....	10	23, 24, 24-25, 25.	Texas.....	2	7, 7-8.
Massachusetts...	10	9, 9-10.	Washington.....	2	6-7.
Florida.....	6	23-24, 24-25, 25, 26.	Illinois.....	1	7-8.
Arkansas.....	4	16, 22, 22-23, 23.	Iowa.....	1	8.
Alabama.....	3	23-24.	Kentucky.....	1	23.
Connecticut.....	3	9, 9-10.	New Jersey.....	1	9.
Colorado.....	2	7-8, 15, 20, 22-23, 23.	New York.....	1	9.
Indiana.....	2	11, 23-24.	Oregon.....	1	10.
			Pennsylvania....	1	9.
			Virginia.....	1	3-4.

## Precipitation to equal or exceed 1.00 in 1 hour.

Arkansas.....	3	16, 23.	Indiana.....	1	23.
Louisiana.....	3	20, 23.	Missouri.....	1	7.
Florida.....	1	26.			

## Table of excessive precipitation, March, 1893.

State and station.	Monthly rainfall to inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
<i>Alabama.</i>						
Elba.....	<i>Inches.</i>	<i>Inches.</i>		<i>Inches</i>	<i>h. m.</i>	
Eufaula.....		2.50	24			
Geneva.....		3.05	24			
		4.00	23			
<i>Arkansas.</i>						
Brinkley.....		2.50	16	2.50	2 00	16
Forrest.....				2.10	1 30	23
Fulton.....		3.00	22-23			
Madding.....		2.75	22			
Stuttgart.....		2.66	23	1.20	0 10	23
<i>California.</i>						
Arcata.....	10.68					
Boulder Creek.....	16.91					
Crescent City.....	13.03					
Crescent City L. H.....	12.57					
Delta.....	11.90					
Duarte.....	11.20	3.75	4-5			
Do.....		3.43	20			
Dunsmuir.....	13.30					
Edmonton.....	13.89	2.75	10			
Emigrant Gap.....	10.05					
Eureka.....	10.59					
Fall Brook.....		3.60	20			
Felton.....	12.52					
Georgetown.....	17.69	8.25	19-20			
Glendora.....	14.56	2.60	8			
Do.....		5.56	20			
Glen Ellen.....	11.64					
Grass Valley (a).....	12.40	2.83	20			
Grass Valley (b).....	11.93	2.96	20			
Hydesville.....	10.26					
Iowa Hill.....	12.94	4.70	19-20			
Kennedy Gold Mine.....	12.04	8.06	18-21			
Laurel.....	12.54					
Los Angeles.....		2.51	20-21			
Mariposa.....	11.67					
Middletown.....		3.72	10-11			
Mokelumne Hill.....	11.83	2.72	20			
Mount Glenwood.....		4.16	10-11			
National City.....		3.67	21			
Nevada City.....	12.75	3.00	20			
Newcastle (a).....		3.50	20			
Oleta.....	11.40	5.50	19-20			
Pasadena.....	10.47	2.76	20-21			
Placerville (a).....	12.29					
Placerville (b).....	13.39	2.84	20			
Point Arena L. H.....	10.91					
Poway.....		3.24	20			
Redding (b).....	12.16					
Reprea.....		2.78	19-20			
Santa Barbara (a).....		2.84	20			



Table of excessive precipitation—Continued.

State and station.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
California—Continued.						
Santa Margarita	Inches.	Inches.		Inches	h. m.	
Santa Cruz (a)	11.03					
Shasta	12.30	3.22	7-8			
Shelter Cove	13.93	2.70	9-10			
Summit	14.50					
Towles	16.61					
Colorado.						
Pikes Peak	21.54	6.18	7-8			
Do.		5.68	15			
Do.		2.74	20			
Do.		4.05	22-23			
Rico		2.77	23			
Connecticut.						
Colchester		2.65	9-10			
Southington		2.60	9-10			
Wallingford		2.70	9			
Florida.						
Bristol		4.30	23-24			
Chattahoochee Landing	10.60	3.85	24-25			
Jupiter	12.30	3.45	26	2.95	0 33	26
Lake City	2.83	2.83	25			
Moseley Hall	3.66	3.66	24-25			
Saint Andrews Bay	4.13	4.13	24-25			
Georgia.						
Albany		3.25	24			
Bainbridge		4.00	25			
Blakely		3.60	24			
Cordele		3.25	24-25			
Lumpkin		3.52	24			
Marshallville		2.63	23			
Morgan		2.76	24			
Piscola		3.10	24-25			
Quitman (b)		2.50	24-25			
Reynolds		2.87	24-25			
Illinois.						
Griggsville		4.00	7-8			
Indiana.						
Evansville				1.20	1 00	23
Hawpach		2.60	23-24			
Muncie		2.50	11			
Iowa.						
Fort Madison		2.50	8			
Kentucky.						
Canton		3.00	23			
Louisiana.						
Abbeville		2.50	16			
Baton Rouge		3.25	16-17			
Cameron		3.60	16			
Coushatta (a)				1.65	1 30	23
Donaldsonville		2.50	17			
Farmerville				1.13	0 30	23
Grand Coteau		3.00	16			
Hammond		2.85	16-17			
Houma		2.53	20-21			
Jeanerette		2.59	15-16			
Lake Charles		6.00	20	6.00	6 00	20
Maurepas		2.57	16			
Plaquemine		2.63	16			
Shell Beach		2.80	20			
Massachusetts.						
Fall River (a)		3.50	9-10			
Long Plain		3.90	9-10			
Middleboro		3.65	9-10			
New Bedford (a)		3.84	9-10			
New Bedford (b)		3.61	9-10			
Somerset		3.61	9-10			
South Dennis		3.69	9			
Taunton (b)		3.16	9-10			
Taunton (c)		3.84	9-10			
Woods Holl		2.51	9-10			
Mississippi.						
Canton		2.51	23			
Logtown		2.95	17			
Missouri.						
Lamar				1.20	0 30	7
New Jersey.						
Imlaystown		3.55	9			
New York.						
Setauket		2.78	9			
Oregon.						
Bandon	10.84					
Glenora	14.10					
Langlois	15.85	2.60	10			
Pennsylvania.						
Wellsboro		2.75	9			
Rhode Island.						
Kingston (b)		3.60	9-10			
Providence (a)		2.98	9-10			
Providence (b)		2.73	9-10			
Providence (c)		3.02	9-10			
South Dakota.						
Alexandria		2.66	8			
Faulkton		2.75	12-13			
Texas.						
Arlington		2.50	7			
Waco		2.75	7-8			
Virginia.						
Spottsville		2.57	3-4			
Washington.						
Aberdeen	10.82					

Table of excessive precipitation—Continued.

State and station.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Washington—Continued.						
East Clallam .....	12.47					
Neah Bay .....	14.83	3.08	6-7			
Tatoosh Island.....	12.63	2.86	6-7			

## MAXIMUM RAINFALL IN ONE HOUR OR LESS.

The following table is a record of the heaviest rainfall during March, 1893, for periods of five and ten minutes and one hour, as reported by regular stations of the Weather Bureau furnished with self-registering gauges:

## Maximum rainfall in one hour or less.

Station.	Maximum fall in—					
	5 min.	Date.	10 min.	Date.	1 hour.	Date.
	Inch.		Inch.		Inch.	
Atlanta, Ga.	0.25	11	0.36	11	0.50	11
Bismarck, N. Dak.						
Boston, Mass.	0.05	15	0.08	15	0.21	15
Buffalo, N. Y.						
Cincinnati, Ohio	0.03	11	0.05	11	0.20	11
Chicago, Ill.	0.02	8	0.04	8	0.18	8
Cleveland, Ohio						
Denver, Colo.						
Detroit, Mich.	0.03	9	0.05	9	0.21	9
Dodge City, Kans.						
Duluth, Minn.						
Eastport, Me.	0.04	13	0.06	13	0.24	13
Galveston, Tex.	0.10	16	0.11	16	0.17	16
Indianapolis, Ind.	0.06	22	0.09	22	0.29	22
Jacksonville, Fla.	0.20	25	0.35	25	0.91	25
Jupiter, Fla.	0.75	26	1.25	26	2.95	26
Kansas City, Mo.	0.10	23	0.14	23	0.28	23
Key West, Fla.						
Marquette, Mich.						
Memphis, Tenn.	0.20	23	0.40	23	0.65	23
Milwaukee, Wis.						
New Orleans, La.						
New York, N. Y.	0.09	9	0.12	9	0.45	9
Norfolk, Va.	0.07	25	0.09	25	0.22	25
Philadelphia, Pa.	0.05	11	0.06	11	0.20	9
Pittsburg, Pa.						
Portland, Oregon	0.02	17	0.03	17	0.13	17
Saint Louis, Mo.	0.17	22	0.30	22	0.69	22
Saint Paul, Minn.						
Salt Lake City, Utah	0.01	19	0.02	19	0.07	19
San Diego, Cal.	0.10	8	0.19	8	0.45	8
San Francisco, Cal.	0.04	7	0.06	7	0.22	11
Savannah, Ga.	0.22	4	0.30	4	0.53	27
Tampa, Fla.	0.30	17	0.40	17	0.90	26
Washington, D. C.	0.05	9	0.05	9	0.15	9
Wilmington, N. C.	0.10	4	0.12	4	0.29	4

\* Record incomplete on account of snow.

† Self-register out of order.

‡ Less than 0.05 in 1 hour.

The following tables show the number of years for which monthly precipitation to equal or exceed 10.00 inches, daily precipitation to equal or exceed 2.50 inches, and hourly precipitation to equal or exceed 1.00 inch has been reported in the several states and territories for March during the last 23 years:

## Excessive monthly precipitation.

State.	No. years noted.	State.	No. years noted.
Georgia	13	Illinois	3
Alabama	12	New Hampshire	3
California	11	New York	3
Washington	10	Indiana	2
North Carolina	9	New Jersey	2
Oregon	9	Pennsylvania	2
Mississippi	9	Virginia	2
Tennessee	8	Wisconsin	2
Florida	6	Delaware	1
Louisiana	6	Kentucky	1
Arkansas	5	Kansas	1
Massachusetts	4	Maryland	1
South Carolina	4	Nebraska	1
Texas	4	Ohio	1
Connecticut	3	Rhode Island	1

## Excessive monthly precipitation—Continued.

State.	No. years noted.	State.	No. years noted.
Utah	1	Minnesota	0
Arizona	0	Missouri	0
Colorado	0	Montana	0
District of Columbia	0	Nevada	0
Idaho	0	New Mexico	0
Indian Territory	0	The Dakotas	0
Iowa	0	Vermont	0
Maine	0	West Virginia	0
Michigan	0	Wyoming	0

## Excessive daily precipitation (24 hours).

Alabama	18	New Jersey	3
Georgia	16	Pennsylvania	3
Louisiana	14	Vermont	3
Texas	13	Colorado	2
Florida	13	Rhode Island	2
North Carolina	12	The Dakotas	2
Tennessee	12	Arizona	1
Mississippi	10	District of Columbia	1
Arkansas	9	Missouri	1
Illinois	8	Utah	1
Indiana	8	Indian Territory	1
South Carolina	6	Delaware	0
Massachusetts	6	Idaho	0
New York	6	Maine	0
Connecticut	5	Michigan	0
California	5	Minnesota	0
Washington	5	Montana	0
Ohio	4	Nebraska	0
Iowa	4	Nevada	0
Kentucky	4	New Hampshire	0
Oregon	4	New Mexico	0
Virginia	4	West Virginia	0
Kansas	3	Wisconsin	0
Maryland	3	Wyoming	0

## Excessive hourly precipitation.

Texas	8	Kansas	0
Tennessee	6	Kentucky	0
Florida	6	Maine	0
North Carolina	4	Maryland	0
Louisiana	3	Massachusetts	0
Georgia	2	Michigan	0
Alabama	2	Minnesota	0
Virginia	2	Montana	0
Arkansas	2	Nebraska	0
Mississippi	1	Nevada	0
New York	1	New Hampshire	0
Pennsylvania	1	New Mexico	0
Indiana	1	Ohio	0
Missouri	1	Oregon	0
Arizona	0	Rhode Island	0
California	0	South Carolina	0
Colorado	0	The Dakotas	0
Connecticut	0	Utah	0
Delaware	0	Vermont	0
District of Columbia	0	Washington	0
Idaho	0	West Virginia	0
Illinois	0	Wisconsin	0
Indian Territory	0	Wyoming	0
Iowa	0		

The following tables give exceptionally heavy monthly, daily, and hourly precipitation reported for March during the last 23 years:

## Monthly.

Station and state.	Am't.	Year.	Station and state.	Am't.	Year.
	Inches.			Inches.	
Delta, Cal.	37.53	1889	Dunsmuir, Cal.	21.39	1889
Cisco, Cal.	25.30	1882	Summit, Cal.	21.05	1879
Alta, Cal.	24.30	1879	Fort Stevens, Oregon	20.76	1873
Neah Bay, Wash.	23.83	1879	Carlouville, Ala.	20.50	1875
Emigrant Gap, Cal.	22.12	1874	Terrell, Tex.	20.12	1875
Do	21.69	1879	Bellevue, Nebr.	20.00	1882

## Daily (24 hours).

Station and state.	Amount.	Date.	Station and state.	Amount.	Date.
	Inches.			Inches.	
Okaloosa, La.	12.65	9, 1878	Atlanta, Ga.	7.36	29, 1886
Kosciusko, Miss.	12.60	5-7, 1891	Montgomery, Ala.	7.24	26-27, 1888
Georgetown, Cal.	8.25	19-20, 1893	Rising Sun, Ind.	6.90	5-6, 1874
Kennedy G'd Mine, Cal.	8.06	18-21, 1893	Hatteras, N. C.	6.73	30, 1879
Fort Stevens, Oregon	8.03	23-25, 1879	Vaiden, Miss.	6.71	7-8, 1891
South Fork, Ky.	8.00	22, 1890	Creswell, Kans.	6.70	31, 1876
Chattanooga, Tenn.	7.61	29-30, 1886	Charleston, Tenn.	6.57	30, 1886

## Excessive daily precipitation—Continued.

Station and state.	Amount.	Date.	Station and state.	Amount.	Date.
	Inches.			Inches.	
Vicksburg, Miss.	6.47	7-8, 1891	Diamond, Ga.	5.40	7-8, 1891
Mobile, Ala.	6.46	24, 1872	Rabun Gap, Ga.	5.40	28, 1888
Union Springs, Ala.	6.20	27, 1888	Clinton, Tenn.	5.30	30, 1886
Winnboro, La.	6.10	7-8, 1891	Wilmington, N. C.	5.26	27, 1882
Lake Charles, La.	6.00	20, 1893	Sharp, Tenn.	5.23	7-8, 1891
Clarksville, Tex.	6.00	28, 1875	Union Springs, Ala.	5.15	23-24, 1892
Terrell, Tex.	6.00	5, 1876	Hatteras, N. C.	5.06	21-22, 1877
Fayetteville, N. C.	6.00	28, 1882	Hawkinsville, Ga.	5.12	25-26, 1892
Sturdevant, Ala.	5.91	24-25, 1892	Point Pleasant, La.	5.01	14-15, 1880
Palestine, Tex.	5.75	3-4, 1888	Marshallville, Ga.	5.07	25, 1892
Canton, Miss.	5.65	7-8, 1891	Thayer, Mo.	5.01	10-11, 1890
Loudon, Tenn.	5.61	30, 1886	Hendersonville, N. C.	5.00	7-8, 1891
Knoxville, Tenn.	5.56	29-30, 1886	Fort Sully, S. Dak.	5.00	21-22, 1871
Glendora, Cal.	5.56	20, 1893	Tiffin, Ohio	5.00	12-13, 1874
Oleta, Cal.	5.50	19-20, 1893	Marengo, Ind.	5.00	12-13, 1890
Columbus, Miss.	5.48	5-6, 1891	Lake Charles, La.	5.00	12-13, 1890

## One hour and less.

Station and state.	Amount.	Time.	Date.
	Inches.	h. m.	
Wilmington, N. C.	0.32	0.05	18, 1892
Saint Louis, Mo.	0.30	0.05	27, 1890
Jupiter, Fla.	0.25	0.05	23, 1890
Do	0.25	0.05	7, 1892
Stuttgart, Ark.	1.20	0.10	23, 1893
Saint Louis, Mo.	0.60	0.10	27, 1890
Key West, Fla.	0.35	0.10	27, 1891
Centralia, Ill.	1.33	0.15	28, 1890
Howe, Tex.	1.75	0.20	21, 1890
Merkel, Tex.	1.56	0.30	10, 1890
Biscayne, Fla.	4.10	0.30	28, 1874
Kingston Springs, Tenn.	1.67	0.30	25, 1884
Jupiter, Fla.	2.95	0.33	26, 1893
Terrell, Tex.	4.00	1.00	19, 1876

## SNOW.

On the 3d a heavy snowstorm, with high wind and rapidly falling temperature, prevailed generally over the states of the lower Ohio and middle Mississippi valleys. On the 4th the storm of snow and wind reached the middle Atlantic coast, and snow fell as far south as Montgomery, Ala., in the morning. At Pasadena, Cal., snow pellets fell in sufficient quantity to whiten the ground the afternoon of the 9th. On the 11th the heaviest snowfall on record for that section was reported in the eastern part of Fresno County, Cal. A heavy snowstorm, with a northeast gale, prevailed in Minnesota and Upper Michigan on the 13th. During the day and night of the 22d snow drifted by high wind interrupted traffic in the eastern Dakotas and Minnesota.

## MONTHLY SNOWFALL (in inches and tenths).

Chart V shows the depth of snowfall reported for the month.

The greatest depth of snowfall reported was 179, at Pikes Peak, Colo. A depth of 145 was noted at Summit, Cal. 61 was noted at Flagstaff, Ariz.; 60 at Siskiyou, Oregon; 54 at Palmetto, Nev.; and 52 at Chama, N. Mex. In the mountains of Colorado and northeastern California the monthly snowfall exceeded 30. In the mountains of New England, at Marquette, Mich., at points in the Dakotas, extreme northern Wisconsin, northern Nebraska, northern Utah, central Nevada, and central Idaho the depth was 20, or more. Snow fell along the Atlantic coast to South Carolina, and the southern limit of snow is shown by a line traced from central Georgia and central Alabama west-northwest to southern Kansas, and thence to extreme western Texas. Heavy snow fell in the mountains of southwestern California, and the snow line reached the coast at Eureka, Cal.

## DEPTH OF SNOW ON GROUND ON THE 15TH AND AT THE CLOSE OF THE MONTH.

At points in the interior of New England, over the north-



ern lake region, and thence over the eastern Dakotas, at stations in the Rocky and Sierra Nevada mountains, and at points in northeastern Utah, central and northeastern Nevada, a depth of 20, or more, was noted on the 15th. On that date the snow line extended southward over the Alleghany range of mountains to extreme northeastern Tennessee, thence over Kentucky and central Missouri to southern Nebraska, thence to central Arizona, thence to east-central California, and thence along the Sierra Nevada and Cascade ranges of mountains to British Columbia.

At the close of the month snow to a depth of 20, or more, was reported in the mountains of New England, Colorado, Idaho, eastern Oregon, eastern Washington, and northeastern California, and at stations in Upper Michigan, northern Wisconsin, central Minnesota, and north-central North Dakota. A slight depth of snow was reported on the ground generally in the interior of New England, New York, and Lower Michigan, and over the greater part of Wisconsin, Minnesota, North Dakota, and northern South Dakota.

Monthly snowfall of 10 inches, or more, was reported as follows, and in states and territories where the maximum depth was below that amount the station reporting the greatest is given:

*Alabama*.—Auburn, Clanton, Cordova, Gadsden, Jasper, Lynn, Maysville, Montgomery, Scottsboro, Talladega, and Tallassee Falls, trace. *Arizona*.—Flagstaff, 61; Chiricahua Mountains, 19.2; Payson, 14; Whipple Barracks, 13.5; Fort Bowie and Natural Bridge, 12. *Arkansas*.—Keesees Ferry, 1. *California*.—Summit, 145; Edmanton, 89; Emigrant Gap, 73; Towles, 61; Dunsmuir, 56; Truckee, 43; Tehachapi (b), 28.5; Shasta, 27.2; Tehachapi (a), 21; Boca, 18; Iowa Hill, 16; Edgwood, 15.5; Nevada City, 12.5; San Ardo (b), 12; Fort Bidwell, 11.2; Mariposa, 11; Grass Valley (a), 10. *Colorado*.—Pikes Peak, 179; Climax, 65; Cumbres, 60; Rico, 52.9; Breckenridge, 52.1; Pagoda (near), 49; Meeker, 42.5; Red Cliff, 35.1; Lay, 32.5; Moraine, 22; Dillon, 18.5; Collbran, 12.8; Saint Cloud, 10.

*Connecticut*.—North Franklin, 11. *Delaware*.—Millsboro, 12.5; Seaford, 11.5. *District of Columbia*.—Washington, 2. *Georgia*.—Diamond, 3.3. *Idaho*.—Martin, 38.5; Garden Valley, 28; Idaho Falls, 16.2; Bonanza City, 14; American Falls, 13; Ruthburg, 12. *Illinois*.—Saint John, 5.5. *Indiana*.—Laconia, 6.5. *Iowa*.—Villisca, 17.3; Blockton, 12; Winterset, 11.2; Blakeville, 11. *Kansas*.—Atchison and Morse, 10. *Kentucky*.—Lexington, 6.2. *Maine*.—Indian Stream, 13; Farmington, 12.5. *Maryland*.—Cambridge, 12.3; Denton, 12; Barren Creek Springs, 11; Sunnyside, 10.9. *Massachusetts*.—Woods Holl, 18.5; Hyannis, 18; South Dennis and Vineyard Haven, 16; Monroe, 13.5; Plymouth, 11.5; New Bedford (a), 11; Provincetown, 10.5; Adams (a) and Gilbertville, 10. *Michigan*.—Marquette, 28.4; Calumet, 17; Lathrop, 14; Berrien Springs (a), 12.8; Escanaba, 11.7; Alpena, 10.4; Berrien Springs (b) and Washington, 10.

*Minnesota*.—Duluth and Wabasha, 16.4; Montevideo, 16; Sandy Lake Dam, 15.3; Ortonville, 15; Alexandria (b) and Leech Lake, 14; Caledonia and Long Prairie, 13; Maple Plain, 12.9; Alexandria (a) and Blooming Prairie, 12; Park Rapids, 11.6; Minnesota City and Saint Charles, 11; Lake Winnibigoshish, 10.6; Pine River, 10.5; Camden, 10. *Mississippi*.—Palo Alto, Pontotoc, and University, trace. *Missouri*.—Liberty, 9. *Montana*.—Powder River, 8.5. *Nebraska*.—Whitman, 30; Ewing, 22; Hay Springs, 20.5; Valentine, 14.8; Kennedy and Ponca, 12; Arborville, 10. *Nevada*.—Palmetto, 54.5; Stofiel, 33; Carlin, 32.5; Tybo, 30; Palisade, 26; Belmont, 24.9; Monitors Ranch, 24.6; Austin, 20.5; Halleck, 17.5; Saint Clair, 16.5; Genoa and Sunnyside, 16; Elko, 14.5; Empire Ranch, 14; Virginia City and Winnemucca, 12.2; Lewers Ranch and Wells, 12; Tuscarora, 11.5; Carson City, 10.6; Cranes Ranch, 10.5.

*New Hampshire*.—West Milan, 25; Bethlehem, 23; Berlin Mills, 21; Lancaster, 20; North Conway, 19; Littleton, 18; Stratford, 15; Sanbornton, 11. *New Jersey*.—Cape May and Woodbine, 12; Elizabeth, 11; Ocean City, 10.4. *New Mexico*.—Chama, 51.5; Monero, 12. *New York*.—Le Roy, 17; Utica, 15.8; Alfred Center and Turin, 14; Victor, 13; South Canisteo, 12.5; Wedgwood, 11.8; Brookfield, 11.5; Humphrey and Number Four, 11.2; Albion, 11; Eden Center, 10.5; Arcade, 10.4. *North Carolina*.—Louisburg, 6. *North Dakota*.—Jamestown, 28.4; Ashley, 24; Forman, 17.5; Bismarck, 16.9; Wild Rice, 16; Berlin and Ellendale, 12.5; Willow City, 11; Mayville and Napoleon, 10. *Ohio*.—Garrettsville, 12.5. *Oregon*.—Siskiyou, 60; Crook, 27; Sparta, 24; Joseph, 20; Lakeview, 16; Canyon City, 14.5; Happy Valley, 11.9; Silver Lake, 10.5; Baker City, 10.1.

*Pennsylvania*.—Meadville, 14; Girardville, 13.5; Clarion, 11.3. *Rhode Island*.—Kingston (b) and Pawtucket, 9. *South Carolina*.—Greenville, 1.5. *South Dakota*.—Fort Meade and Webster, 33.5; Wessington, 28.5; Aberdeen and Fort Sully, 28; Bowdle, 24; Mellette, 22.2; Wolsey, 20.5; Frankfort, 20; Oelrichs, 19.8; Spearfish, 18; Gary, 17; Gale, 16.2; Watertown, 15.8; Millbank, 15.3; Hotch City, 14.2; Castlewood, 13.5; Huron, 13; Ashcroft, 12; Pierre, 11.6; Cross, 11.4; Parkston, 11; Britton and Sioux Falls, 10.6; Midland, 10.5; Alexandria, Parker, and Plankinton, 10. *Tennessee*.—Greeneville, 4.6. *Texas*.—El Paso, trace.

*Utah*.—Ogden (a), 31; Levan, 29.5; Scofield, 28; Castle Gate, 23; Fort Du Chesne, 21; Corinne and Grouse Creek, 20.5; Stockton, 18.7; Promontory, 17; Blue Creek, 16; Beaver and Losee, 14.5; Salt Lake City, 13.7; Provo City, 12.5; Parowan, 12; Lake Park, 11; Randolph, 10. *Vermont*.—Stratford, 20; Chelsea, 12. *Virginia*.—Birdsnest, 7.6. *Washington*.—Chelan, 10.7. *West Virginia*.—Bluefield and Davis, 10. *Wisconsin*.—Bayfield, 21; Centralia, 18; Ashland, 17.2; Osceola, 16.3; Florence, 16; Barron, 15.5; Menomonie, 14.6; Hayward, 14; Columbus and Shawano, 13; Chippewa Falls, Green Bay, and Stevens Point, 12.5; Depere, 12.1; Medford (a), 12; Viroqua, 11; La Crosse, 10.8; Medford (b), 10.5; Koepnick and Oconto, 10. *Wyoming*.—Lander, 13.4; Camp Pilot Butte, 11.5.

#### HAIL.

Description of the more severe hailstorms reported for the month is given under "Local Storms".

Hail was reported as follows: 2d, Illinois, Indian Territory, and Missouri. 3d, Alabama, Arkansas, Georgia, Kansas, Louisiana, Mississippi, Missouri. 4th, California and Mississippi. 5th, Alabama. 6th, Arizona and California. 7th, Arizona, Colorado, New Jersey, and Texas. 8th, California, Illinois, Indiana, Missouri, Ohio, Oregon, Texas, and Washington. 9th, Arizona, California, Ohio, and Washington. 10th, California, Iowa, Oregon, South Dakota, Washington, and Wisconsin. 11th, California, Indiana, Michigan, Ohio, Oregon, Tennessee, Virginia, and West Virginia. 12th, California, Oregon, and Washington. 13th, Oregon. 14th, Nevada. 15th, California, Nevada, Rhode Island, and Washington. 16th, Alabama, Louisiana, and Washington. 17th, Washington. 18th, Nevada, North Carolina, South Carolina, and Washington. 19th, Oregon. 20th, California, Iowa, Louisiana, and Mississippi. 21st, California and Missouri. 22d, Iowa, Kansas, Mississippi, Missouri, Nebraska, Ohio, Oklahoma, and Texas. 23d, Arizona, Arkansas, Indiana, Iowa, Kentucky, Louisiana, Michigan, Mississippi, Missouri, Oklahoma, Tennessee, and Texas. 24th, Florida, Illinois, Michigan, New York, and Ohio. 25th, Colorado and Florida. 26th, Florida, Georgia, and Texas. 27th, Georgia and Kansas. 28th, Massachusetts and Mississippi. 29th, Florida, Oregon, and Washington. 30th, Montana, Oregon, and Washington. 31st, Washington.

## SLEET.

Description of the more severe sleetstorms of the month is given under "Local Storms."

Sleet was reported as follows: 1st, South Dakota. 2d, Iowa and South Dakota. 3d, Arkansas, Illinois, Kansas, Kentucky, Michigan, Mississippi, Missouri, Nebraska, New Jersey, and Virginia. 4th, Alabama, Missouri, Nevada, North Carolina, South Carolina, and Virginia. 5th, California and Nevada. 6th, Missouri and Washington. 7th, California, Nebraska, Oregon, and Washington. 8th, Arizona, Illinois, Iowa, Kentucky, Minnesota, Nebraska, and Washington. 9th, Arizona, Colorado, Indiana, Minnesota, Nevada, Utah, Washington, and Wisconsin. 10th, Minnesota, Nebraska, North Dakota, South Dakota, and Texas. 11th, California, Iowa, Michigan, Nevada, New York, North Dakota, Oregon, and Utah.

12th, California, Michigan, Montana, New Hampshire, North Dakota, and Washington. 13th, Colorado, Iowa, Minnesota, Nebraska, and South Dakota. 14th, Illinois, Michigan, New York, and Virginia. 15th, Maine and Nevada. 16th, Alabama, Arkansas, Florida, Louisiana, and Missis-

issippi. 17th, Arkansas, Georgia, Kentucky, Mississippi, Nevada, South Carolina, Tennessee, Virginia, and Washington. 18th, Alabama, Mississippi, Oregon, South Carolina, Virginia, and Wisconsin. 19th, Montana, Ohio, South Dakota, and Utah. 20th, Colorado, Georgia, Nevada, South Dakota, and Wisconsin. 21st, Iowa, Michigan, Minnesota, Missouri, Nebraska, Nevada, New Jersey, New York, and Utah.

22d, Colorado, Illinois, Iowa, Michigan, Minnesota, Nebraska, Nevada, New Jersey, New York, Ohio, Pennsylvania, South Dakota, and Wisconsin. 23d, Connecticut, Iowa, Maine, Michigan, Minnesota, Nebraska, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, South Dakota, Utah, and Wisconsin. 24th, Connecticut, Illinois, Maine, Michigan, Minnesota, Mississippi, Nebraska, Oregon, and Washington. 25th, Colorado, Minnesota, Nebraska, Ohio, and Utah. 26th, Colorado, Indiana, South Dakota, and Utah. 27th, Kansas, Missouri, Montana, Nebraska, North Carolina, and Oregon. 29th, Georgia and Washington. 30th, Massachusetts and New York. 31st, Colorado, New York, South Dakota, and Utah.

## WINDS.

The prevailing winds in March, 1893, are shown on Chart II by arrows flying with the wind. In New England the winds were generally from west to north; in the middle Atlantic states and on the middle-eastern slope of the Rocky Mountains, from the northwest; in the west Gulf states, from southeast to south; in the Ohio Valley and Tennessee, from south to southwest; in the lower lake region, the extreme northwest, the Missouri Valley, and over the southern plateau region, from west to northwest; in the upper lake region and upper Mississippi valley, from northwest to north; on the southeast slope of the Rocky Mountains, from south to west; over the middle plateau region and along the north and middle Pacific coasts, from southeast to southwest; over the northern plateau region, from the south; and in the south Atlantic and east Gulf states, over the Florida Peninsula, on the northeast slope of the Rocky Mountains, and along the south Pacific coast, variable.

## HIGH WINDS (in miles per hour).

Wind velocities of 50 miles, or more, per hour were reported at regular stations of the Weather Bureau as follows: 2d, 51, nw., at Woods Holl, Mass. 3d, 60, e., at Tatoosh Island, Wash. 4th, 60, n., at Kittyhawk, N. C.; 56, nw., at Hatteras, N. C.; 50, nw., at Galveston, Tex.; 50, e., at Tatoosh Island, Wash. 7th, 60, s., at Fort Canby, Wash. 8th, 55, se., at Chicago, Ill. 9th, 56, sw., at Amarillo, Tex.; 54, ne., at Block Island, R. I. 10th, 72, s., at Fort Canby, Wash.; 60, ne., at Block Island, R. I.; 60, nw., at Kearney, Nebr.; 56, nw., at Colorado Springs, Colo.; 52, nw., at Valentine, Nebr.; 50, sw., at Amarillo, Tex.; 50, e., at Tatoosh Island, Wash. 11th, 66, s., at Fort Canby, Wash.; 52, nw., at Kearney, Nebr.; 51, se., at Keeler, Cal.; 50, nw., at Valentine, Nebr. 12th, 85, w., at Pikes Peak, Colo.; 58, sw., at Amarillo, Tex.; 54, nw., at Colorado Springs, Colo. 13th, 50, nw., at Colorado Springs, Colo. 14th, 54, e., at Tatoosh Island, Wash. 15th, 90, sw., at Pikes Peak, Colo.; 50, se., at Amarillo, Tex. 16th, 50, nw., at Block Island, R. I. 17th, 61, e., at Tatoosh Island, Wash.; 56, se., at Fort Canby, Wash. 18th, 92, w., at Pikes Peak, Colo.; 50, s., at Amarillo, Tex. 21st, 56, sw., at Amarillo, Tex. 22d, 60, sw., at Amarillo, Tex.; 56, ne., at Chicago, Ill.; 50, sw., at Abilene, Tex. 24th, 56, sw., at Chicago, Ill.; 54, w., at Columbus, Ohio. 27th, 52, s., at Fort Canby, Wash.; 50, sw., at Key West, Fla. 31st, 82, sw., at Pikes Peak, Colo.; 66, s., at Fort Canby, Wash.; 57, nw., at Colorado Springs, Colo.

## LOCAL STORMS.

**3d.**—In the evening severe local storms occurred in the east Gulf states. The more destructive storms of this group visited Lauderdale and Clarke counties, in extreme east-central Mississippi, about 6 p. m., the adjoining counties of Sumter and Choctaw, in Alabama, between 6.30 and 7 p. m., and Troup, Meriwether, Pike, and northern Upson counties, in extreme west-central Georgia, between 8.30 and 9 p. m. At Vicksburg, Miss., a thunderstorm, with rain and hail, began 5 p. m. and ended 5.40 p. m. (75th meridian time). At Meridian, Miss., a thunderstorm, with rain, began 7.48 p. m. and ended 8.17 p. m. (75th meridian time); from 6.50 to 7.05 p. m. the wind was high from the southwest. At Toomsdaba, Lauderdale County, Miss., a funnel-shaped cloud moved eastward in a path 250 to 300 yards in width about 6 p. m., attended by heavy thunder, vivid lightning, heavy rain after, and small hail. Articles were carried up in the funnel, and property was destroyed to the estimated value of \$30,000 to \$40,000.

At Pachuta, Clarke County, Miss., a storm moved southeast in a path about 200 yards in width, with heavy rain during and after, continuous vivid lightning, and some hail. One person was killed; trees were torn up by the roots or twisted off, and were piled in and to the right of the center of the path, and a number of buildings were torn to pieces. The value of property destroyed at Pachuta was placed at \$12,000 to \$15,000. A heavy thunder and hail storm moved northeast in a path  $\frac{1}{4}$  to  $\frac{1}{2}$  mile in width near Cuba, Sumter County, Ala., about 6.30 p. m., killing one person and leveling timber. About 7 p. m. a storm passed eastward in a path 250 to 300 yards in width through a sparsely settled district, 10 miles from Butler, Choctaw County, Ala., with heavy rain before, small hail, sheet lightning, and some thunder.

At Montgomery, Ala., a thunderstorm approached from the northwest at 8.38 p. m. (75th meridian time). From 8.40 to 9.50 p. m. the lightning was incessant and there was a continuous rumble of thunder. Hail fell at 9.05 p. m., some of the hailstones being one-half inch in diameter and irregular in shape; a second fall of hail occurred from 9.41 to 9.44 p. m. At 9.45 p. m. the wind reached a velocity of 41 miles per hour from the northwest. The storm was very severe north of Montgomery. At Tuscaloosa, Ala., a heavy thunder and hail storm moved southeast at 5.45 p. m.; a number of buildings were blown down. A severe storm passed south of Lagrange, Troup County, Ga., at 8.30 p. m., injuring a number of persons, and destroying many buildings. The electrical



display was brilliant and the thunder continuous and heavy. One observer at that point reported a funnel-shaped cloud, and what appeared a ball of fire. This storm apparently followed an almost due east course across Troup, Meriwether, and Pike counties, Ga., a distance of more than 60 miles, at an average velocity of about 42 miles per hour.

A severe thunderstorm passed Hogansville, Troup County, Ga., at 8.30 p. m., without causing material damage. At Odessa, Meriwether County, Ga., 6 persons were killed, and 3 houses, only, were left standing. At Woodbury, Meriwether County, 2 persons were killed. At that place heavy rain, a straight wind, thunder, lightning, and hail were reported. At Greeneville, Meriwether County, the path of destruction was about one-quarter mile in width, and the storm was attended by incessant thunder and lightning, large hail, and heavy rain. At that point one person was killed and 74 buildings were wrecked; the aggregate value of property destroyed was placed at \$150,000. At Molena, Pike County, Ga., a thunderstorm moved east in a path about  $\frac{1}{2}$  mile in width at 8.50 p. m., killing one person and destroying property to the value of about \$7,000.

At Piedmont, Pike County, Ga., a thunder, rain, and hail storm moved east with a whirling motion in a path  $\frac{3}{4}$  mile in width at 9 p. m., killing 1 person, injuring 30, and destroying or damaging a large number of houses. One person was reported killed near Barnesville, Pike County. A violent storm passed through the southern edge of Forsyth, Monroe County, Ga., at 10 p. m., destroying about 20 houses. The storm was attended by very brilliant, incessant lightning. At 9 p. m. a violent, whirling storm, with thunder, lightning, and heavy rain moved east at The Rock, Upson County, Ga., in a path  $\frac{1}{2}$  to  $\frac{3}{4}$  mile in width. A number of persons were reported killed, and many were injured. Within a distance of 6 miles 75 to 100 houses, mostly outbuildings, were destroyed, and many large trees were broken off 10 to 12 feet above the ground. At Albany, Dougherty County, Ga., a heavy thunderstorm prevailed from 11 p. m., 3d, to 3 a. m., 4th. At Atlanta, Ga., a thunderstorm from the southwest prevailed from 8.30 to 9.45 p. m. (75th meridian time).

During high wind and dense fog a steamer went ashore on the outer beach of Santa Rosa Island, near Pensacola, Fla.; salvage expenses amounted to about \$6,000. At Jacksonville, Fla., a southwest gale began in the evening and continued during the 4th, with maximum velocity 48 miles per hour at 1.35 a. m., 4th. At Charleston, S. C., a thunderstorm began 10.40 p. m., 3d, and ended 4.10 a. m., 4th, with light rain, and high west to northwest winds. At Springfield, Mo., light rain, with rapidly falling temperature, some thunder, and northeast wind, prevailed until 10.40 a. m., when the rain changed to heavy snow. Snow continued during the day, the total depth being 4 inches, and high northeast changing to northwest winds prevailed in the afternoon. A blinding snowstorm, with high northwest wind and rapidly falling temperature, prevailed at Laconia, Ind.

**4th.**—At Titusville, Fla., the wind veered from south to west in the early morning and continued high until evening. A northwest gale, with snow from 7.30 to 8.55 a. m., prevailed at Montgomery, Ala., in the morning. At Port Royal, S. C., a violent thunderstorm at 2 a. m. was followed by a west gale which continued all day. A thunderstorm, with rain, occurred in the early morning at Hatteras, N. C. Snow fell from 2.30 to 3.15 p. m., and from 6.35 to 7 p. m., with a northerly gale. A schooner stranded on the beach 1 mile north of the station at 3 p. m. At Wilmington, N. C., rain and a moderate thunderstorm from the southwest began 12.10 a. m., and ended during the early morning. The wind veered from southwest to northwest and increased in force, reaching a velocity of 48 miles per hour at 1.25 p. m. Rain began 9.50 a. m., attended by snow for about 10 minutes. At Norfolk, Va., rain

changed to heavy snow 9.26 a. m., and snow ended 4.10 p. m., with a heavy northwest gale. At Cape Henry, Va., the wind reached a velocity of 64 miles per hour from the northwest at 5.32 p. m., and at intervals during the day reached 60 miles per hour. Light rain changed to snow 10.30 a. m.; snow changed to rain at 3 p. m.; and the rain ended 4.20 p. m. At Lynchburg, Va., rain changed to heavy snow 6.50 a. m., and snow ended 11.25 a. m., with high west to north winds. High northwest wind and heavy snow prevailed in the afternoon and evening at Atlantic City, N. J.

**7th.**—A light hailstorm occurred at Devine, Tex. Eight miles southeast of Devine considerable damage was caused by hail. A severe wind and rain storm was reported at Winnaboro, La.

**8th.**—High wind at night caused some damage about Shelbyville, Ky. At 3 p. m. a thunderstorm, with heavy rain, moved northeast over Vincennes, Ind., causing damage of a minor character. About 4.35 p. m. a storm which seemed to barely touch the roofs of houses moved northeastward over Brooklyn, Ind.; no thunder was heard; heavy rain fell after the passage of the storm. Several houses were reported prostrated during a storm at Princeton, Ind. At Olney, Ill., several buildings were wrecked by a storm which advanced from the southwest.

**9th.**—Heavy rain flooded streets at New London, Conn. Considerable damage was caused by heavy rain and flood about South Canisteo, N. Y. Excessive rainfall caused a freshet in the Raritan River, N. J. During a southwest gale a schooner was wrecked near Ocracoke, N. C.

**10th.**—A thunderstorm, with high wind, was reported at Austin, Tenn., at night. Heavy rain the night of the 10th caused damage about Water Valley, Miss.

**11th.**—At Fresno, Cal., light rain fell all day, and heavy snow was reported in the mountains; a heavy hailstorm was reported on the west side of the valley. A southeast gale prevailed at Red Bluff, Cal., in the early morning.

**13th.**—High wind, with snow, prevailed over Minnesota, northern Wisconsin, and Upper Michigan; snow interrupted railroad traffic.

**14th.**—Heavy thunder and rain storms were reported at night in Connecticut; at Manchester, Conn., lightning struck five times, and telegraphic communication between New Haven and Hartford was interrupted. The early morning of the 15th a church in North Middleboro, Mass., was struck by lightning. In the evening a barn was struck by lightning and burned at Cold Spring, N. J.

**17th.**—At Saint Petersburg, Fla., a small house was struck by lightning and burned.

**22d.**—At Toledo, Ohio, sleet fell at intervals in the morning, and rain continued all day, with high southeast wind. In the evening rain froze as it fell, interrupting telegraphic communication. At Valley Junction, Wis., heavy sleet attended a thunderstorm at night. At Oklahoma City, Okla., a disturbance was observed in the upper atmosphere at 7 p. m. The wind, which had been blowing from the south at a velocity of 25 miles per hour, veered to west for 15 minutes and then shifted rapidly to the various points of the compass. From 7 to 7.30 p. m. the clouds in the west assumed a greenish hue, became very dense, and had the white fringe peculiar to hailstorm clouds. At 10 p. m. the tornado moved northeast over the city, the path being about  $\frac{1}{4}$  mile from the Weather Bureau office. The storm cloud presented the appearance of an inverted funnel. The lower end of the funnel-shaped cloud swung from side to side, and at times descended to the earth. The cloud had a whirling motion, and was attended by a sullen, grinding noise. Heavy rain, with thunder and lightning, fell from 10.15 to 11.10 p. m. One person was seriously injured, and 14 buildings, valued at \$15,000, were destroyed. At the Weather Bureau office the

wind reached a velocity of 60 miles per hour. An observer about 3 miles northeast of Oklahoma noted three funnel-shaped clouds as the storm approached. When the storm struck he was thrown to the ground, and darkness prevented further observation until after the disturbance had passed. The path of destruction through the city of Oklahoma was 50 feet to 50 yards in width. Some houses were twisted and others had one end torn off. Debris in the center of the path lay in a confused heap; articles in the south part of the track were twisted in toward the center, and debris was scattered 4 miles south of the path. Buildings on the north edge of the path seemed pressed toward the center. A heavy southwest gale prevailed during the day and at night at Amarillo, Tex. A heavy windstorm overturned small building at Brownwood, Tex.

**23d.**—Severe local storms occurred in the evening from Arkansas, northern Louisiana, and northern Mississippi over western Kentucky and southern and central Indiana. At Crawfordville, Ark., a severe storm, with thunder, lightning, and rain, moved northeast in a path  $\frac{1}{4}$  to  $\frac{1}{2}$  mile in width at 3 p. m., destroying and damaging buildings to the extent of about \$10,000. A destructive storm moved northeast through a sparsely settled district between Mangham and Archibald, La., about 2.30 p. m.; several persons were reported killed, and a number of buildings were destroyed. A storm moved northeast through a thinly settled district,  $1\frac{1}{2}$  mile north of Shubuta, Miss., at 3 p. m., with heavy rain and vivid lightning, killing 3 persons and fatally injuring one. Prostrated trees showed a right to left whirling motion.

A thunder and hail storm moved northeast over Kelly, Miss., at 4 p. m.; the path of destruction was  $\frac{1}{2}$  mile in width; several persons were reported killed, and the loss of property in that section was placed at \$150,000. At Shaw, Miss., a heavy thunder and rain storm moved northeast in a path about 500 feet in width at 4 p. m., without causing material damage. A thunderstorm, with rain and some hail, moved northeast over Cleveland, Miss., at 4 p. m. A heavy thunder, rain, and hail storm passed northeast over Renova, Miss., about 4.30 p. m. At Palo Alto, Miss., a southwest gale at 4 p. m. caused damage of a minor character, and from 7 to 11 p. m. a thunderstorm from the southwest prevailed. A thunderstorm, with light rain, moved northeast near Jackson, Tenn., at 5 p. m. At 5.15 p. m. a thunderstorm, with hail before and rain after, moved northeast 2 miles southwest of Spring Creek, Tenn., blowing down trees and damaging buildings in a path about  $\frac{1}{2}$  mile in width.

A heavy rainstorm, with some thunder and lightning, moved northeast over Dresden, Tenn., about 5.30 p. m. A thunder and rain storm from the southwest visited Luray, Tenn., at 7.30 p. m. About 15 miles west of Luray, buildings were destroyed and 2 persons were injured. Considerable damage of a minor character was caused by a thunder, rain, and hail storm which visited Gallatin, Tenn., about 7.30 p. m. At Nashville, Tenn., a thunderstorm began 8.15 p. m. (75th meridian time), and continued until the early morning of the 24th. The wind, which had been high from the southeast, veered to southwest at 9 p. m., and at 9.15 p. m. reached a velocity of 42 miles per hour. The rainfall was heavy, and small hail fell from 8.30 to 8.35 p. m. In the northern portion of Nashville 15 to 20 buildings were demolished, one person was killed, and many were injured. A thunderstorm moved northeast over Clarksville, Tenn., at 8.30 p. m., unroofing a number of buildings.

A severe thunder and rain storm passed northeast over Murray, Ky., at 5.50 p. m.; an infant was injured, and property to the estimated value of \$30,000 was destroyed. A small, dark, smoky-looking column attended the passage of the storm at Murray. At Henderson, Ky., a thunder, rain, and hail storm moved northeast in a path about 200 yards in

width at 6.45 p. m., damaging property to the estimated value of \$75,000. At 7.15 p. m. heavy thunderstorms were reported at Pembroke and Guthrie, Ky. Tobacco barns 12 miles west of Guthrie were blown down. A thunder and rain storm, with hail, passed northeast over Bowling Green, Ky., at 7.30 p. m., damaging buildings, etc., to the extent of about \$20,000. At Louisville, Ky., rain, attended by a violent thunderstorm, began 7.58 and ended 11 p. m. (75th meridian time). A light thunderstorm passed northeast at Hopkinsville, Ky., at 9.30 p. m. At Lexington, Ky., a thunderstorm began 10.15 p. m. (75th meridian time), and ended the early morning of the 24th; a barn was struck by lightning and burned.

A light thunderstorm, with heavy rain, visited Danville, Ky., between 10 and 11 p. m. A thunder and hail storm moved northeast over Rowland, Ky., at 11.30 p. m. in a path about 300 feet in width, destroying property to the value of \$10,000. At Mount Vernon, Ind., a heavy thunderstorm continued 2 hours, causing damage of a minor character. A thunderstorm, with hail, visited Evansville, Ind., at 6.30 p. m.; considerable damage was caused by heavy rain. At 6.40 p. m. a destructive storm moved in a northerly direction over Chandler, Ind., with heavy thunder, lightning, rain, and hail. The storm apparently had two paths, one west and the other east of Chandler. Within 4 miles of that place 2 persons were injured, one fatally, and one church, 4 residences, and 10 barns were destroyed. At 7 p. m. a thunderstorm moved northeast over Loogootee, Ind.; 2 buildings were damaged by wind. A destructive storm occurred one-half mile from Huntingburg, Ind., at 7 p. m. A severe thunderstorm, with moderate rain and hail, visited Boonville, Ind., about 7 p. m.

At 7.30 p. m. a thunderstorm, with heavy rain and small hail, moved northeast over Bedford, Ind., destroying and damaging buildings to the extent of \$30,000. A thunderstorm passed northeast over McCordsville, Ind., at 8.30 p. m.; within a radius of 15 miles property was damaged to the estimated value of \$10,000. A heavy thunder, rain, and hail storm moved northeast over Mooresville, Ind., at 8.30 p. m.; considerable damage was caused in that section. At Brooklyn, Ind., the loss to property was estimated at \$5,000. A thunder and rain storm moved northeast over Alexandria, Ind., at 9 p. m.; one person was killed, and a building was damaged to the extent of \$3,000. A severe thunder, rain, and hail storm moved northward over Greenwood, Ind., at 9 p. m.

A thunderstorm from the southwest reached Indianapolis, Ind., at 9.11 p. m., and ended at that place 10.07 p. m. (75th meridian time). Heavy rain fell from 9.28 to 9.48 p. m., and light rain continued until the early morning of the 24th. The storm was destructive in the northwest suburbs of Indianapolis, where a squall of wind from the southwest wrecked a number of frail buildings, damaged others, and broke or uprooted 30 to 40 trees in a path about 250 yards in width. Some damage was caused by a thunderstorm at Leipsic, Ohio. At Bronson, Mich., a heavy thunderstorm, with heavy rain, began 6 p. m., 23d, and continued until the morning of the 24th. A thunderstorm, with high wind, damaged buildings at Carrollton, Mo. At Plover, Wis., a building was struck by lightning and burned. A heavy snowstorm, with high wind, extended from the Dakotas over Minnesota. At Red Wing, Minn., a thunderstorm, with sleet, occurred in the evening.

**24th.**—A heavy rain and thunder storm damaged fields and roads about Fitchburg, Mich. A severe thunder, rain, and hail storm moved east 3 miles south of Vossburg, Miss.

**25th.**—At Titusville, Fla., a thunderstorm was observed approaching from the northwest in the afternoon. Light rain fell from 4.10 to 4.15 p. m. At 5 p. m. the wind shifted from southeast to north, and in 10 minutes increased from



12 to 46 miles per hour. The gale continued until 6.30 p. m. A second thunderstorm, with rain, prevailed from 5.55 to 7.30 p. m.

**26th.**—An exceptionally severe thunderstorm from the southwest prevailed at Jupiter, Fla., from 6.32 to 7.05 p. m.; 2.95 inches of rain fell in 33 minutes. At Titusville, Fla., a thunderstorm from the northwest occurred in the morning,

and heavy rain and wind squalls occurred at intervals until 11 p. m.

**27th.**—During a thunder and hail storm in the afternoon at Emporium, Kans., a barn was struck by lightning and a horse killed. A hailstorm was reported about 5 p. m. 3 miles southwest of Rome, Kans.; several outbuildings were destroyed.

### INLAND NAVIGATION.

#### STAGE OF WATER IN RIVERS.

The following table shows the danger-points at the various river stations; the highest and lowest stages for the month, with the dates of occurrence; and the monthly ranges:

*Heights of rivers above low-water mark, March, 1893.*

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Height.	Date.	Height.	Date.	
<i>Red River.</i>	<i>Feet.</i>	<i>Feet.</i>		<i>Feet.</i>		<i>Feet.</i>
Shreveport, La. ....	29.9	20.7	25-27	15.0	7	5.7
<i>Arkansas River.</i>						
Fort Smith, Ark. ....	22.0	12.1	11	3.5	27	8.6
Little Rock, Ark. ....	23.0	16.9	11	8.3	23	8.6
<i>Missouri River.</i>						
Fort Buford, N. Dak. *	14.0					
Pierre, S. Dak. *	14.0					
Sioux City, Iowa †	18.7	14.0	13	3.4	17, 18	10.6
Kansas City, Mo. ....	21.0	14.2	16	6.0	1	8.2
<i>Mississippi River.</i>						
Saint Paul, Minn. *	14.0					
La Crosse, Wis. *	11.8					
Dubuque, Iowa *	16.0					
Davenport, Iowa †	15.0	13.1	13	5.8	22, 23, 30, 31	7.3
Keokuk, Iowa †	14.0	13.3	17	8.1	31	5.2
Hannibal, Mo. ....	17.0	13.7	19	4.5	8	9.2
Saint Louis, Mo. ....	30.0	22.1	19, 20	12.0	1	10.1
Cairo, Ill. ....	40.0	44.9	1	28.6	10	16.3
Memphis, Tenn. ....	33.0	33.1	3	24.1	13, 14	9.0
Vicksburg, Miss. ....	41.0	42.4	13-15	38.3	1	4.1
New Orleans, La. ....	13.0	13.9	18-21, 27	12.8	1	1.1
<i>Ohio River.</i>						
Parkersburg, W. Va. ....	38.0	26.1	14	9.0	23	17.1
Cincinnati, Ohio. ....	45.0	36.9	16, 17	18.8	27	18.1
Louisville, Ky. ....	24.0	12.7	17	7.9	28	4.8
<i>Cumberland River.</i>						
Nashville, Tenn. ....	40.0	24.0	15	7.7	26	16.3
<i>Tennessee River.</i>						
Chattanooga, Tenn. ....	33.0	12.0	14	5.7	31	6.3
Knoxville, Tenn. ....	29.0	6.5	12	2.5	23, 26	4.0
<i>Monongahela River.</i>						
Pittsburg, Pa. ....	29.0	16.6	13	5.5	8	11.1
<i>Savannah River.</i>						
Augusta, Ga. ....	32.0	21.0	1	8.0	23, 24, 31	13.0
<i>Willamette River.</i>						
Portland, Oregon. ....	15.0	6.0	31	2.4	15	3.6
<i>Susquehanna River.</i>						
Harrisburg, Pa. ....	17.0	14.6	14	2.5	6, 7	12.1
<i>Alabama River.</i>						
Montgomery, Ala. ....	48.0	19.5	5	6.6	23, 24, 31	12.9
<i>James River.</i>						
Lynchburg, Va. ....		4.0	5	1.1	29-31	2.9
<i>Sacramento River.</i>						
Red Bluff, Cal. ....	18.6		11	4.2	2	14.4
Sacramento, Cal. ....	26.5		22	20.0	8	6.5

\* River frozen. † For 20 days. ‡ For 19 days. § For 23 days.

#### ICE IN RIVERS AND HARBORS AND OPENING OF NAVIGATION.

Navigation opened on the Connecticut River between Hartford and Saybrook on the 14th.

**Hudson.**—Ice opposite Albany moved down the night of the 12th, and the river rose rapidly from 3 a. m. to 12.30 p. m., 13th, at which time the gorge which had formed below the city, gave way. During the 14th the river continued high at Albany, and the ice was firmly gorged and piled to a depth of 20 to 30 feet on the overslaugh. The river was reported open from Newburg to New York on the 13th, and from New York to Poughkeepsie on the 17th. The afternoon of the 13th an ice gorge in the creek above Rondout, N. Y., broke and carried 35 boats into the Hudson River, where a number were sunk and others damaged. On the 15th the river was high and the ice firm between Coeymans and Sing Sing. On the 23d the river opened at Albany and closed between Castleton and Poughkeepsie. Heavy ice was running in the river at Albany

on the 24th. On the 25th the ice gorge below Albany moved, and the river was reported clear to New York. On the 31st the first through boat of the season, the steamer "Dean Richmond," arrived at Albany from New York.

Floods, caused by ice gorges, occurred in the smaller rivers and streams of New York and Pennsylvania. On the 10th ice was running in the Genesee River at Rochester, N. Y. The West Branch of the Susquehanna River was frozen at Lock Haven, Pa., on the 1st; 9th, ice moving; 13th, slush ice running. Ice passed out of the Susquehanna River at Wilkesbarre, Pa., on the 10th; 13th, river rising, with large quantities of floating ice. Steamboats resumed their trips on the Delaware River at Beverly, N. J., on the 1st. At Selins Grove, Pa., the river was full of floating ice and drift on the 13th. At Towanda, Pa., running ice was noted on the 10th, 12th, and 13th. On the 10th heavy ice passed down the Raritan River at New Brunswick, N. J. Heavy ice gorges were reported in the Maumee River, Ohio. Ice passed out of the Illinois and Fox rivers at Ottawa, Ill., on the 8th. Ice passed out of the Illinois River at Hennepin, Ill., on the 8th, and at Havana, Ill., on the 9th. On the 12th the first boat of the season passed Havana. On the 9th and 10th ice passed out of the Fox River at Oswego, Ill. Ice gorges flooded streams in Michigan, Wisconsin, and Nebraska. Ice broke up in the Rock River at Beloit, Wis., on the 11th. Ice began to break up in the Des Moines River at Des Moines, Iowa, on the 10th; the river was almost clear of ice at that point on the 18th. Ice broke up in the Cedar River at Cedar Rapids, Iowa, on the 13th. Ice broke up in the Loup River near Genoa, Nebr., on the 10th, damaging many bridges. The Little Missouri River opened at Medora and Yule, N. Dak., on the 28th. Ice began to run out of the Powder River at Powder River, Mont., on the 26th. At Miles City, Mont., ice in the Tongue River broke up on the 27th. Ice broke up in the Yellowstone River at Glendive, Mont., on the 28th.

**Mississippi River.**—At the close of the month the river was open near each bank at Red Wing, Minn.; in mid-stream the ice was solid. At Dubuque, Iowa, ice broke up below the bridge and gorged at the bend on the 13th; 20th, ice above the bridge broke; 23d, river clear of ice; 25th, navigation resumed. At Davenport, Iowa, the ice began to break up on the 12th; 13th, ice moved out at 10 a. m., but gorged below the city, and the river rose rapidly; at Rock Island, Ill. (opposite Davenport), considerable damage was caused by ice; 14th, first steamer of the season passed down the river; 15-17th, river full of floating ice; 27th, several steamers from up and down the river arrived, and navigation opened. The first steamer of the season passed down the river at Keokuk, Iowa, on the 20th. The first up-river boat of the season passed Hannibal, Mo., on the 14th.

**Missouri River.**—Ice from the Yellowstone River caused a rise in the Missouri River of 10 to 12 feet at Fort Buford, N. Dak., on the 30th. On the 29th ice began to run out in a narrow channel on the west side of the river at Yankton, S. Dak. Ice broke up near Santee Agency, Nebr., on the 9th. At Sioux City, Iowa, ice ran out on the 12th; running ice was noted from the 13th to the 15th. At Leavenworth, Kans.,

the river was rising rapidly and full of floating ice on the 15th; from the 16th to the 18th large quantities of floating ice were noted.

Large fields of floating ice were reported in the river at Buffalo, N. Y., on the 30th. Lake Erie was free from ice at Erie, Pa., on the 25th. On the 28th a steam barge left Cleveland, Ohio, for Kellys Island; this was the first departure of the season. On the 29th the "City of Detroit" arrived at Cleveland from Detroit, Mich.; this was the first arrival of the season. Ice in the Maumee River began to move at Toledo, Ohio, at 5 a. m. of the 10th; at 10 a. m. a small gorge formed at the lower end of the city. On the 11th the gorge broke, and the ice passed out. On the 21st a steamer arrived from Monroe, Mich.; this was the first arrival of the season at Toledo. Floating ice was noted in the river at Detroit, Mich., on the 18th to 21st, 26th, and 27th. The "City of Detroit" cleared for Cleveland on the 29th; this was the first departure of the season. At the close of the month the western part of Lake Saint Clair was reported clear of ice. On the 1st a steamer broke the ice between Port Huron and Sarnia and resumed her trips. On the 9th the Saint Clair River was open from Lake Huron to Marysville; 14th, Saint Clair River open from Lake Huron to Saint Clair; 21st, 22d, and 25th, large quantities of floating ice in the river at Port Huron; 25th, the American shore of Lake Huron free from ice about Port Huron; on the Canadian shore the ice was firm. On the 25th a steamer left Manistee, Mich., for Frankfort, Mich.; this was the first departure of the season. On the 31st very little ice was visible from Manistee. On the 8th a brisk easterly wind drove the ice out of the harbor at Grand Haven, Mich., and a steamer which had been fast in the ice several days left for Milwaukee. On the 15th the harbor continued open, but an immense field of ice extended off the piers. On the 30th the

harbor was blocked by ice. On the 31st southerly winds drove the ice northward, and the harbor opened. An enormous ice gorge was reported in the river above the dam at Milwaukee, Wis., on the 13th.

#### FLOODS.

Destructive floods resulted from ice gorges in rivers and streams in New York, Pennsylvania, Michigan, Wisconsin, and Nebraska. The night of the 12th ice in the Hudson River broke and gorged at Albany, N. Y. The water rose rapidly, reaching a higher point than in 1861, and rose 2 feet above the high water mark of 1887. During that date streets in low-lying parts of Albany and low lands about the city were flooded, and large quantities of goods stored in cellars and the lower floors of mercantile houses were damaged. The afternoon of the 10th ice in the Genesee River broke and gorged near Mount Morris, N. Y., and parts of that village and adjacent low ground were submerged. On the 13th cellars along the Genesee River in Rochester, N. Y., were flooded. The water ceased to rise at Rochester the early morning of the 14th. On the 10th water from the Susquehanna River covered the flats between Wilkesbarre and Kingston, Pa. From the 13th to the 19th floods occurred in the rivers and streams of Lower Michigan. At points along the Grand River the water was reported the highest in many years. Destructive floods were also reported in Wisconsin. In Nebraska streams overflowed their banks, many bridges were washed away, and washouts on railroads interrupted railroad traffic. During the early part of the third decade of the month streams in the San Joaquin Valley and in southwestern California were swollen to a dangerous height. Towns and villages and large tracts of cultivated land were submerged.

### ATMOSPHERIC ELECTRICITY.

#### THUNDERSTORMS.

Description of the more severe thunderstorms reported for the month is given under "Local storms."

Thunderstorms were reported as follows: East of the Rocky Mountains they were reported in the greatest number of states, 22, on the 23d and 24th; in 16 on the 8th; in 15 on the 22d; in 14 on the 14th; in 11 on the 3d, 9th, and 11th; in 10 on the 2d and 10th; in 9 on the 20th and 21st; in 8 on the 27th; in 7 on the 13th, 15th, 25th, and 26th; in 6 on the 12th and 16th; in 5 on the 17th and 28th; in 4 on the 4th and 7th; in 3 on the 30th; in 2 on the 1st and 31st; and in one on the 5th, 6th, 18th, and 29th. The 19th was the only date on which thunderstorms were not reported.

East of the Rocky Mountains thunderstorms were reported on the greatest number of dates, 15, in Florida and North Carolina; on 14 in Mississippi; on 13 in Texas; on 11 in Missouri; on 10 in Arkansas, Louisiana, and Virginia; on 8 in Illinois, Kansas, Michigan, and Tennessee; on 7 in Alabama, Georgia, Indiana, Iowa, Kentucky, Ohio, and Wisconsin; on 6 in Minnesota and New York; on 5 in Nebraska and West Virginia; on 4 in Connecticut and South Carolina; on 3 in New Hampshire, New Jersey, North Dakota, Oklahoma, and Pennsylvania; on 2 in Indian Territory, Maine, Massachusetts, and Vermont; and on one in Delaware, District of Columbia, Maryland, Rhode Island, and South Dakota.

West of the Rocky Mountains thunderstorms were reported in Arizona on the 6th; in California on the 8th to 11th, 18th, and 20th; in Colorado on the 7th and 22d; in Nevada on the 20th and 21st; in Oregon on the 5th, 7th, 8th, 10th, 11th,

15th, 20th, and 27th; in Utah on the 21st. In states and territories other than those named no thunderstorms were reported.

#### AURORAS.

Auroras were reported as follows: 6th, Crook, Oregon; 7th, Fergus Falls, Minn.; Mingusville, Mont.; Fort Buford, N. Dak.; Medford and Shawano, Wis. 8th, Havre, Mont. 13th, Galva, Ill.; Turin, N. Y.; Appleton, Wis. 14th, Amana and Cresco, Iowa; Morton, Kans.; Sault Ste. Marie, Mich.; Clear Lake, Collegeville, Fergus Falls, Maple Plain, Saint Olaf, and Wilmer, Minn.; Havre, Mont.; Santee Agency, Nebr.; Ashley, Bowdle, Fort Stevenson, Grand Forks, Napoleon, Sykeston, and Woodbridge, N. Dak.; Barron, Butternut, Grantsburg, Haywards, Medford, Reedsburg, and Valley Junction, Wis. 15th, North Billerica, Mass.; Sault Ste. Marie, Mich.; Sandy Lake Dam, Minn.; Havre, Mont.; New Brunswick, N. J.; Brookline, N. H.; Honeyamead Brook, N. Y.; Fort Buford and Woodbridge, N. Dak.; Barron and Haywards, Wis.

16th, Gaynor, Colo.; Fort Stevenson, N. Dak.; Chelsea, Vt.; Ashland, Wis. 17th, Angola, Ind. 20th, Williamston, Mich.; Albany, Oregon. 23d, Noble, Mich.; Crook, Oregon; Harvey and Medford, Wis. 24th, Palermo, N. Y.; Lakota, N. Dak.; Ashland and Harvey, Wis. 25th, Indian Stream, Me.; Collegeville, Minn.; Lyons, N. Y.; Fort Buford and Jamestown, N. Dak.; Harvey, Wis. 26th, David City, Nebr. 27th, Moscow, Idaho; Waverly, N. Y.; Crook, Oregon. 28th, Indian Stream, Me.; Sault Ste. Marie, Mich. 30th, Ashland, Va.; Harvey, Wis. 31st, Blakeville, Iowa; Parkersburg, W. Va.



## STATE WEATHER SERVICES.

[Temperature in degrees Fahrenheit; precipitation, including melted snow, in inches and hundredths.]

The following extracts and summaries are republished from reports for March, 1893, of the directors of the various state weather services:

## ALABAMA.

*Temperature.*—The mean was 0.3 above the normal; maximum, 84, at Montgomery, 10th; minimum, 13, at Maysville, 4th; greatest monthly range, 68, at Newburg; least monthly range, 45, at Healing Springs.

*Precipitation.*—The average was 2.11 below the normal; greatest monthly, 7.73, at Geneva; least monthly, 2.18, at Florence.

*Wind.*—Prevailing direction, northwest.—*P. H. Mell, Observer, Weather Bureau, Auburn, director.*

## ARIZONA.

*Temperature.*—Maximum, 102, at Fort Mohave, 28th; minimum, 3, at Flagstaff, 11th; greatest monthly range, 72, at Palomas and Holbrook; least monthly range, 50, at Walnut Ranch.

*Precipitation.*—The average was 1.41 above the normal; greatest monthly, 6.75, at Flagstaff; least monthly, 0.03, at Teviston.

*Wind.*—Prevailing direction, southwest.—*W. Burrows, Observer, Weather Bureau, Tucson, director.*

## ARKANSAS.

*Temperature.*—The mean was 1 below the normal; maximum, 82, at Corn- ing, 22d, and at Camden, 23d; minimum, 5, at Winslow, 4th; greatest monthly range, 74, at Rogers and Keesees Ferry; least monthly range, 48, at Prescott.

*Precipitation.*—The average was 1.46 below the normal; greatest monthly, 5.71, at Madding; least monthly, 1.95, at Memphis, Tenn.

*Wind.*—Prevailing direction, south.—*M. F. Locke, Commissioner of Agriculture, Little Rock, director; F. H. Clarke, Local Forecast Official, Weather Bureau, assistant.*

## CALIFORNIA.

*Temperature.*—Maximum, 101, at Indio, 30th; minimum, 10, at Boca, 13th; greatest monthly range, 69, at Indio; least monthly range, 27, at Poway.

*Precipitation.*—The average was 2.38 above the normal; greatest monthly, 17.69, at Georgetown; least monthly, 0.55, at Needles.

*Wind.*—Prevailing direction, south.—*J. A. Barwick, Observer, Weather Bureau, Sacramento, director.*

## COLORADO.

*Temperature.*—Maximum, 88, at Kit Carson, 31st, and at Minneapolis, 30th; minimum, —15, at Alma, 14th; greatest monthly range, 100, at Minneapolis; least monthly range, 51, at Stamford.

*Precipitation.*—Greatest monthly, 6.50, at Climax; least monthly, 0.00, at Hugo and Sanborn.—*J. J. Gilligan, Observer, Weather Bureau, Denver, director.*

## FLORIDA.

*Temperature.*—The mean was about normal; maximum, 89, at Orange City, 24th, and at Plant City, 23d; minimum, 26, at Bristol, 4th, and at Moseley Hall and Tallahassee, 5th; greatest monthly range, 59, at Bristol; least monthly range, 27, at Key West.

*Precipitation.*—The average was about 1.63 above the normal; greatest monthly, 9.95, at Lake City; least monthly, trace, at Key West.

*Wind.*—Prevailing directions, southeast and southwest.—*E. R. Demain, Observer, Weather Bureau, Jacksonville, director.*

## GEORGIA.

*Temperature.*—The mean was 0.8 below the normal; maximum, 87, at Cordele, 31st; minimum, 12, at Diamond, 4th; greatest monthly range, 67, at Hawkinsville; least monthly range, 46, at Hepzibah.

*Precipitation.*—The average was 2.00 below the normal; greatest monthly, 6.64, at Blakely; least monthly, 1.42, at Union Point.

*Wind.*—Prevailing direction, northwest.—*Park Morrill, Local Forecast Official, Weather Bureau, Atlanta, director.*

## IDAHO.

*Temperature.*—Maximum, 74, at Boise Barracks, 29th; minimum, —14, at American Falls, 3d; greatest monthly range, 74, at American Falls; least monthly range, 43, at Kootenai.

*Precipitation.*—Greatest monthly, 2.97, at Garden Valley; least monthly, 0.98, at Boise Barracks.

*Wind.*—Prevailing direction, south.—*J. H. Smith, Observer, Weather Bureau, Idaho Falls, director.*

## ILLINOIS.

*Temperature.*—The mean was 0.8 above the normal; maximum, 82, at Carlinville, 30th, and at Griggsville and Rushville, 31st; minimum, —2, at Effingham, 3d.

*Precipitation.*—The average was 0.37 above the normal; greatest monthly, 6.22, at Griggsville; least monthly, 0.68, at Shawneetown.

*Wind.*—Prevailing direction, northwest.—*John Craig, Observer, Weather Bureau, Springfield, director.*

## INDIANA.

*Temperature.*—The mean was 2.9 above the normal; maximum, 79, at Laconia, 31st; minimum, 7, at Markle, 16th; greatest monthly range, 68, at Laconia; least monthly range, 50, at Valparaiso.

*Precipitation.*—The average was 0.10 below the normal; greatest monthly, 6.52, at Muncie; least monthly, 1.39, at Hammond.

*Wind.*—Prevailing direction, southwest.—*Prof. H. A. Huston, Lafayette, director; C. F. R. Wappenhans, Local Forecast Official, Weather Bureau, assistant.*

## IOWA WEATHER AND CROP SERVICE.

*Temperature.*—The mean was about 1.0 below the normal; maximum, 84, at Glenwood, 30th; minimum, —8, at Alta and Eagle Grove, 8th; greatest monthly range, 84, at Bonaparte; least monthly range, 60, at Dubuque.

*Precipitation.*—The average was about normal; greatest monthly, 4.40, at Fulton; least monthly, 0.64, at Denison.

*Wind.*—Prevailing direction, northwest.—*J. R. Sage, Des Moines, director; G. M. Chappel, Local Forecast Official, Weather Bureau, assistant.*

## KANSAS.

*Temperature.*—The mean was 0.8 above the normal; maximum, 95, at Abilene, 30th, and at Kiowa, 31st; minimum, —9, at Monument, 4th; greatest monthly range, 95, at Englewood, Eureka Ranch, Lakin, and New England Ranch; least monthly range, 69, at Leavenworth.

*Precipitation.*—The average was 0.48 below the normal; greatest monthly, 3.08, at Horton; least monthly, 0.00, at several stations.

*Wind.*—Prevailing direction, south.—*T. B. Jennings, Observer, Weather Bureau, Topeka, director.*

## KENTUCKY.

*Temperature.*—The mean was 0.9 below the normal; maximum, 89, at Springfield, 23d; minimum, 5, at Springfield, 3d; greatest monthly range, 84, at Springfield; least monthly range, 52, at Catlettsburg.

*Precipitation.*—The average was 1.42 below the normal; greatest monthly, 5.59, at Canton; least monthly, 1.47, at Catlettsburg.

*Wind.*—Prevailing direction, southwest.—*Frank Burke, Local Forecast Official, Weather Bureau, Louisville, director.*

## LOUISIANA.

*Temperature.*—The mean was about 1.0 above the normal; maximum, 88, at Plain Dealing, 10th, at Maurepas, 24th, at Donaldsonville, 22d and 23d, and at Franklin, 21st; minimum, 17, at Winnsboro, 5th; greatest monthly range, 68, at Winnsboro; least monthly range, 29, at Port Eads.

*Precipitation.*—The average was about 1.50 below the normal; greatest monthly, 8.30, at Lake Charles; least monthly, 1.54, at Cheneyville.

*Wind.*—Prevailing direction, north.—*R. E. Kerkam, Local Forecast Official, Weather Bureau, New Orleans, director.*

## MARYLAND.

*Temperature.*—Maximum, 73, at Barren Creek Springs, 24th; minimum, 6, at Sunnyside, 5th; greatest monthly range, 64, at Sunnyside; least monthly range, 42, at Great Falls.

*Precipitation.*—Greatest monthly, 4.14, at Cambridge; least monthly, 1.00, at Cumberland.

*Wind.*—Prevailing direction, northwest.—*Dr. William B. Clark, Johns Hopkins University, Baltimore, director; Prof. Milton Whitney, Maryland Agricultural College, secretary and treasurer; C. P. Cronk, Observer, Weather Bureau, in charge.*

## MICHIGAN.

*Temperature.*—The mean was 0.4 above the normal; maximum, 67, at Ypsilanti and Adrian, 23d; minimum, —16, at Bellaire, 16th.

*Precipitation.*—The average was 0.07 above the normal; greatest monthly, 4.53, at Berrien Springs (a); least monthly, 0.74, at Hillsdale.

*Wind.*—Prevailing direction, southwest.—*E. A. Evans, Local Forecast Official, Weather Bureau, Detroit, director.*

## MISSISSIPPI.

*Temperature.*—The mean was 1.8 below the normal; maximum, 88, at Columbus, 10th, and at Crystal Springs and Vaiden, 23d; minimum, 17, at University, 4th; greatest monthly range, 69, at Columbus; least monthly range, 42, at Hattiesburg.

*Precipitation.*—The average was 3.12 below the normal; greatest monthly, 6.19, at Logtown; least monthly, 0.20, at Batesville.

*Wind.*—Prevailing direction, south.—*R. J. Hyatt, Local Forecast Official, Weather Bureau, Vicksburg, director.*

#### MISSOURI.

*Temperature.*—Maximum, 86, at McCune, 31st; minimum, zero, at Phillipsburg, 4th.

*Precipitation.*—Greatest monthly, 5.16, at Saint Louis; least monthly, 1.10, at Cowgill.

*Wind.*—Prevailing direction, southwest.—*Miss Ida L. Crume, Secretary, State Board of Agriculture, Columbia, director; H. A. McNally, Observer, Weather Bureau, assistant.*

#### NEBRASKA.

*Temperature.*—Maximum, 96, at Lexington, 30th; minimum, —18, at Ansley, 4th; greatest monthly range, 105, at Lexington; least monthly range, 54, at Burwell.

*Precipitation.*—Greatest monthly, 2.41, at Valentine; least monthly, trace, at Indianola.

*Wind.*—Prevailing direction, northwest.—*Prof. Goodwin D. Swezey, Crete, director; G. A. Loveland, Observer, Weather Bureau, assistant.*

#### NEVADA.

*Temperature.*—The mean was 2.7 below the normal; maximum, 85, at Downeyville, 8th; minimum, —21, at Stofiel, 3d.

*Precipitation.*—The average was 0.37 above the normal; greatest monthly, 6.23, at Palmetto; least monthly, trace, at Wabuska.

*Wind.*—Prevailing direction, south.—*Prof. Charles W. Friend, Carson City, director; F. A. Carpenter, Observer, Weather Bureau, assistant.*

#### NEW ENGLAND.

*Temperature.*—The mean was 1.2 below the normal; maximum, 64, at Plymouth, 24th; minimum, —25, at West Milan, 19th; greatest monthly range, 80, at West Milan; least monthly range, 36, at Block Island and Waterbury.

*Precipitation.*—The average was 0.29 below the normal; greatest monthly, 7.57, at South Dennis; least monthly, 0.52, at Burlington.

*Wind.*—Prevailing direction, northwest.—*J. Warren Smith, Observer, Weather Bureau, Boston, director.*

#### NEW JERSEY.

*Temperature.*—The mean was 0.2 above the normal; maximum, 69, at Barnegat, 26th; minimum, 5, at Allaire, 6th; greatest monthly range, 58, at Somerville; least monthly range, 40, at Newark.

*Precipitation.*—The average was 0.05 below the normal; greatest monthly, 6.26, at Toms River; least monthly, 2.42, at Pensauken.

*Wind.*—Prevailing direction, northwest.—*E. W. McGann, Observer, Weather Bureau, New Brunswick, director.*

#### NEW MEXICO.

*Temperature.*—Maximum, 87, at Socorro, 31st, and at Los Cruces, 30th; minimum, —2, at Chama, 11th; greatest monthly range, 75, at Chama; least monthly range, 53, at Santa Fe.

*Precipitation.*—Greatest monthly, 5.15, at Chama; least monthly, 0.00, at Folsom and Socorro.

*Wind.*—Prevailing direction, west.—*H. B. Hersey, Observer, Weather Bureau, Santa Fe, director.*

#### NEW YORK.

*Temperature.*—The mean was 0.2 below the normal; maximum, 70, at Albion, 24th; minimum, —7, at Number Four, 19th; greatest monthly range, 69, at Eden Center; least monthly range, 35, at Middletown and Rondout.

*Precipitation.*—The average was 0.55 below the normal; greatest monthly, 6.16, at Eden Center; least monthly, 0.68, at Plattsburg Barracks.

*Wind.*—Prevailing direction, southwest.—*Prof. E. A. Fuertes, Dean of the College of Civil Engineering, Cornell University, Ithaca, director; R. M. Hardinge, Observer, Weather Bureau, assistant.*

#### NORTH CAROLINA.

The month was very favorable for crops and farm work.

*Temperature.*—The mean was 0.5 below the normal; maximum, 82, at Smithfield and Rockingham, 24th; minimum, 5, at Highlands, 5th; greatest monthly range, 75, at Marion; least monthly range, 40, at Hatteras.

*Precipitation.*—The average was 2.75 below the normal; greatest monthly, 4.98, at Lewiston; least monthly, 0.75, at Warrenton.

*Wind.*—Prevailing direction, southwest.—*Dr. Herbert B. Battle, Raleigh, director; C. F. von Herrmann, Observer, Weather Bureau, assistant.*

#### NORTH DAKOTA.

*Temperature.*—The mean was 7.0 below the normal; maximum, 68, at Yule, 30th; minimum, —35, at Bottineau, 14th; greatest monthly range, 84, at Yule; least monthly range, 62, at Churchs Ferry.

*Precipitation.*—The average was 0.31 above the normal; greatest monthly, 3.14, at Jamestown; least monthly, 0.12, at Fort Buford.

*Wind.*—Prevailing direction, northwest.—*W. H. Fallon, Observer, Weather Bureau, Bismarck, director.*

#### OHIO.

*Temperature.*—The mean was 3.0 above the normal; maximum, 87, at Portsmouth, 23d; minimum, —8, at Garrettsville, 16th; greatest monthly range, 81, at Garrettsville; least monthly range, 57, at Harbor.

*Precipitation.*—The average was 0.76 below the normal; greatest monthly, 4.53, at Hiram; least monthly, 0.34, at Milfordton.

*Wind.*—Prevailing direction, west.—*L. N. Bonham, Columbus, director; C. M. Strong, Observer, Weather Bureau, secretary and assistant.*

#### OKLAHOMA.

*Temperature.*—Maximum, 96, at Purcell, 31st; minimum, 5, at Fort Supply, 3d; greatest monthly range, 90, at Fort Supply; least monthly range, 62, at Lehigh.

*Precipitation.*—Greatest monthly, 2.81, at Gwenddale; least monthly, 0.03, at Gate City.

*Wind.*—Prevailing direction, south.—*J. I. Widmeyer, Observer, Weather Bureau, Oklahoma City, director.*

#### PENNSYLVANIA.

*Temperature.*—The mean was 1.0 below the normal; maximum, 74, at Ligonier, 24th; minimum, 3, at Kane, 5th; greatest monthly range, 64, at Ligonier; least monthly range, 38, at Bloomsburg.

*Precipitation.*—The average was 0.62 below the normal; greatest monthly, 5.09, at Wellsboro; least monthly, 0.98, at Uniontown.

*Wind.*—Prevailing direction, northwest.—*Under direction of the Franklin Institute, Philadelphia; W. P. Tatham, director; H. L. Ball, Observer, Weather Bureau, assistant.*

#### SOUTH DAKOTA.

*Temperature.*—The mean was 5.7 below the normal; maximum, 81, at Oelrichs, 30th; minimum, —25, at Faulkton, 15th; greatest monthly range, 95, at Oelrichs; least monthly range, 63, at Gary.

*Precipitation.*—The average was 1.27 above the normal; greatest monthly, 5.49, at Webster; least monthly, 0.71, at Piedmont.

*Wind.*—Prevailing direction, northwest.—*S. W. Glenn, Local Forecast Official, Weather Bureau, Huron, director.*

#### TENNESSEE WEATHER AND CROP SERVICE.

*Temperature.*—The mean was 1.0 above the normal; maximum, 83, at Harriman, 23d; minimum, 10, at Lookout Mountain, Rugby, Austin, and Clarksville, 4th; greatest monthly range, 69, at Clarksville; least monthly range, 54, at Tullahoma.

*Precipitation.*—The average was 2.60 below the normal, and, excepting 1885, was the least rainfall on record for March in 11 years; greatest monthly, 4.55, at Riddleton; least monthly, 0.75, at Jackson and McKenzie.—*J. B. Marbury, Local Forecast Official, Weather Bureau, Nashville, director.*

#### TEXAS.

*Temperature.*—The mean was 0.3 below the normal; maximum, 99, at Twohig, 22d; minimum, 12, at Hartley, 13th; greatest monthly range, 81, at Quanah; least monthly range, 39, at Galveston.

*Precipitation.*—The average was 0.87 below the normal; greatest monthly, 4.09, at Sulphur Springs; least monthly, 0.00, at a number of stations.

*Wind.*—Prevailing direction, southeast.—*D. D. Bryan, Galveston, director; I. M. Cline, Local Forecast Official, Weather Bureau, assistant.*

#### UTAH.

*Temperature.*—The mean was 3.0 below the normal; maximum, 87, at Saint George, 29th; minimum, —19, at Scofield, 1st; greatest monthly range, 79, at Scofield; least monthly range, 45, at Logan.

*Precipitation.*—Greatest monthly, 4.07, at Mount Carmel; least monthly, 0.52, at Loa.

*Wind.*—Prevailing direction, southwest.—*G. N. Salisbury, Observer, Weather Bureau, Salt Lake City, director.*

#### VIRGINIA.

*Temperature.*—Maximum, 80, at Ashland, 22d, at Big Stone Gap, 23d, and at Saluda, 24th; minimum, 9, at Hot Springs, 19th, and at Wytheville, 4th, 8th, and 15th; greatest monthly range, 67, at Saluda and Warsaw; least monthly range, 45, at Hampton.

*Precipitation.*—Greatest monthly, 3.95, at Spottsville; least monthly, 0.81, at Wytheville.

*Wind.*—Prevailing directions, northeast and northwest.—*Dr. E. A. Craig-hill, Lynchburg, director; J. N. Ryker, Observer, Weather Bureau, assistant.*

#### WASHINGTON.

*Temperature.*—The mean was 3.4 below the normal; maximum, 73, at Clyde, 16th; minimum, 4, at Waterville, 2d; greatest monthly range, 58, at Moxee; least monthly range, 19, at Tatoosh Island.



*Precipitation.*—The average was 0.08 below the normal; greatest monthly, 14.83, at Neah Bay; least monthly, 0.84, at Ellensburg.

Wind.—Prevailing direction, south.—*H. F. Alciatore, Observer, Weather Bureau, Olympia, director.*

WEST VIRGINIA.

*Temperature.*—Maximum, 84, at Point Pleasant, 23d; minimum, 3, at Davis, 6th; greatest monthly range, 71, at Nuttallburg; least monthly range, 53, at Martinsburg.

*Precipitation.*—Greatest monthly, 2.89, at Davis; least monthly, 0.89, at New Martinsville.

*Wind.*—Prevailing direction, southwest.—*W. W. Dent, Observer, Weather Bureau, Parkersburg, director.*

## WISCONSIN.

*Temperature.*—The mean was about 3.0 below the normal; maximum, 65.

at Prairie du Chien, 31st; minimum, —30, at Butternut, 3d; greatest monthly range, 81, at Hayward; least monthly range, 51, at Oshkosh and New Holstein.

*Precipitation.*—The average was about 0.40 above the normal; greatest monthly, 3.80, at Janesville; least monthly, 1.13, at Centralia.

Wind.—Prevailing directions, northeast and northwest.—*W. L. Moore,*  
*Local Forecast Official, Weather Bureau, Milwaukee, director.*

## WYOMING.

*Temperature.*—Maximum, 77, at Fort McKinney, 30th; minimum, —10, at Evanston, 14th; greatest monthly range, 81, at Fort McKinney; least monthly range, 58, at Fort Yellowstone.

*Precipitation.*—Greatest monthly, 1.34, at Lander; least monthly, 0.23, at Fort McKinney.

Wind.—Prevailing direction, northwest.—*E. M. Ravenscraft, Observer, Weather Bureau, Cheyenne, director.*

## METEOROLOGICAL TABLES.

*Meteorological record of voluntary and other co-operating observers, March, 1893.*

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean.			Max.	Min.	Mean.	
<i>Alabama.</i>					<i>Arizona—Cont'd.</i>				
Alco	83	26	57-3	4.65	Peoria	91	37	59-2	1-71
Brewton	79	25	55-8	4-65	Phoenix	95	30	61-7	0-46
Citronelle	79	39	58-6	3-76	Red Rock	97	35	62-1	0-40
Clanton	80	28	56-3	2-33	Reymert	87	31	54-0	4-42
Cordova				2-27	Rye				3-96
Daphne	80	26	56-2	3-66	San Carlos	92	26	52-4	2-40
Decatur				3-26	San Simon	89	39	57-8	1-40
Demopolis				4-37	Signal	92	30	57-1	2-29
Elba			55-8	4-97	Teviston				0-03
Eufaula				4-81	Texas Hill	102	45	68-1	
Florence				2-97	Tucson	92	33	57-3	1-16
Florence	79	15	49-9	2-18	Tucson	90	31	48-9	1-02
Gadsden				4-80	Walnut Grove	75	25	48-6	3-12
Geneva	83	34	61-2	7-73	Walnut Ranch	76	25	48-6	1-67
Greensboro	82	23	54-2	3-39	Whipple Barracks	70	5	41-4	2-26
Healing Springs	70	25	53-8	2-66	Willcox	84	32	62-4	0-79
Highland Home	83	22	55-5	3-81	Winslow	82	17	45-3	1-00
Jasper	79	18	50-0	2-83	Yuma	94	41	60-4	1-53
Livingston	81	23	52-2	3-71					
Livingston				3-72	<i>Arkansas.</i>				
Lynn				3-18	Arkadelphia				3-99
Lynn	73	16	52-1	3-65	Arkansas City				2-04
Maple Grove	78	18	54-1	3-38	Brinkley	70	18	48-6	4-83
Marion				3-13	Camden				4-43
Maysville	78	13	51-7	3-98	Camden	82	21	51-4	4-41
Mount Willing	81	24	55-8	3-64	Conway	79	19	50-2	2-88
Newbern	81	24	53-2	4-34	Corning	82	11	48-8	2-86
Newberg	83	15	50-9	3-07	Dallas	76	14	51-1	3-97
Oxanna				3-63	Dardanelle				3-02
Scottsboro	77	16	50-2	2-82	Fayetteville	79	9	47-6	2-11
Selma				3-89	Forrest	78	11	52-6	4-37
Sturdevant				1-27	Fulton				4-36
Talladega				3-11	Gaines Landing	80	22	52-6	2-03
Tallasse Falls				3-64	Harrison	81	10	48-9	3-74
Tuscaloosa				4-41	Helena				3-73
Tusculum	78	17	49-7	2-52	Helena	78	18	51-5	2-85
Tuscumbia				2-54	Hope	76	22	53-8	4-88
Union	80	25	55-1	5-75	Hot Springs	81	10	51-1	4-90
Union Springs	82	22	53-5	2-87	Keesee Ferry	81	7	47-0	3-75
Valley Head	76	15	48-5	2-80	Kirby	78	17	50-4	3-50
Warrior				2-88	Lonoke	75	19	54-4	5-03
Wilsonville				2-78	Madding				5-21
<i>Alaska.</i>					Melbourne	80	10	45-4	2-59
Killianoo	43	22	34-0	3-65	Mount Nebo	62	13	42-1	4-25
Metlakahla	50	22	37-9	4-88	New Gascony	75	20	52-4	3-50
<i>Arizona.</i>					Newport				3-43
Arix. Can. Co. Dam	97			2-69	Newport				4-11
Buckeye	100	31	60-5	1-60	Oacela	79	15	49-4	2-53
Calabasas	85	28	53-2	1-53	Pine Bluff	80	20	51-4	2-07
Casa Grande	90	42	60-8	1-87	Prescott	78	30	53-5	4-57
Chiricahua Mts				2-40	Rogers	80	6	42-8	2-72
Crittenden	88	29	52-3	2-63	Russellville	79	15	50-2	3-88
Dragon				0-93	Searey	78	15	49-0	3-26
Dragon Summit	84	33	53-5	1-15	Stuttgart	78	19	51-6	4-68
Dudleyville	93	31	56-5	1-93	Washington	75	21	53-7	4-71
Flagstaff	70	3	36-9	6-75	Winslow	74	5	45-4	2-50
Florence	94	30	57-6	2-33	<i>California.</i>				
Fort Apache	79	12	43-4	2-45	Agnew	82	35	51-0	5-17
Fort Bowie	82	28	49-2	2-70	Alcalde	86	34	53-2	1-99
Fort Grant	85	25	51-4	1-26	Anaheim	85	43	60-2	6-07
Fort Huachuca	84	26	51-0	2-21	Anderson	73	27	47-9	9-01
Fort Mohave	102	33	60-6	1-09	Antioch	74	40	53-0	2-64
Gila Bend	92	34	62-5	1-70	Aptos	78	34	51-8	7-97
Gila Bend	98	45	60-1	1-94	Arata	75	30	49-0	10-68
Holbrook	84	12	44-4	0-44	Arlington Heights	90	33	53-2	4-83
Maricopa	74	47	59-0	1-14	Athlone	84	35	52-9	3-20
Mount Huachuca	83	24	50-8	2-54	Auburn	80	34	54-0	9-20
Natural Bridge				4-29	Bakersfield	83	40	55-8	2-30
Oracle	82	28	48-8		Bakersfield	88	28	52-2	1-25
Oro				0-80	Ballaast Point L. H.				5-55
Palomas	99	27	58-7	0-67	Beaumont	76	30	50-6	9-67
Pantano	90	36	51-5	0-70	Belmont	79	42	57-4	
Payson	79	25	42-4	5-95	Berendo	82	38	55-7	3-15

*Meteorological record of voluntary observers, &c.—Continued.*

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>California—Cont'd.</i>	°	°	°	<i>Ins.</i>	<i>California—Con.</i>	°	°	°	<i>Ins.</i>
Berkeley.....	74	36	50.6	6.19	Huron * ..	85	32	53.3	1.50
Biggs.....	80	30	55.0	4.53	Hyde Ranch.....	85	39	62.0	3.25
Bishop Creek * ..	84	31	48.7	0.15	Hydesville † ..	75	29	46.8	10.26
Boca * ..	78	10	28.6	4.00	Independence † ..	79	21	46.6	0.98
Borden * ..	80	32	49.7	3.17	Indio * ..	101	33	60.7	1.60
Boulder Creek * ..	80	31	50.8	16.91	Ione * ..	73	32	53.9	5.05
Brentwood * ..	80	33	52.8	2.75	Iowa Hill * ..	79	29	45.1	12.92
Brighton * ..	81	32	50.6	2.55	Irvington † ..	83	33	54.0	5.87
Byron * ..	78	36	53.8	2.43	Jolon.....	75	32	47.8	5.30
Caliente * ..	85	39	52.8	3.71	Keeler * ..	73	31	45.4	6.70
Calistoga * ..	81	32	52.4	9.91	Keene * ..	75	31	45.4	6.70
Campo Seco.....	.....	.....	.....	7.19	Kennedy Gold Mine.....	77	27	45.2	12.04
C. Mendocino L. H.	.....	.....	.....	8.38	King City * ..	80	32	54.1	3.17
Capitola.....	80	38	53.2	.....	Kingsburg * ..	85	34	53.9	3.57
Castroville * ..	79	40	54.5	6.00	Knights Landing * ..	78	41	53.7	3.60
Centerville * ..	84	.....	55.2	5.58	Kono Tayeo.....	67	30	40.6	5.41
Chico * ..	78	34	49.6	5.46	Lagrange * ..	82	33	52.9	5.12
Chino * ..	87	33	55.7	7.43	Lathrop * ..	82	35	54.6	2.78
Cisco.....	42	10	27.8	.....	Laurel * ..	80	33	49.7	12.54
Citrus * ..	.....	.....	45.6	0.30	Leemore * ..	88	33	54.6	2.49
Claremont † ..	83	30	50.6	9.22	Leemore † ..	90	32	53.6	2.68
Colgrove.....	.....	.....	.....	7.72	Lick Observatory † ..	62	23	37.3	8.09
Colton * ..	88	33	54.6	6.64	Lime Point L. H.	.....	.....	.....	5.90
Colusa † ..	73	34	51.2	1.96	Livermore * ..	77	35	50.2	3.68
Corning * ..	80	33	50.9	5.00	Livingston * ..	86	40	54.7	2.03
Crescent City.....	.....	.....	.....	13.03	Loati.....	80	34	53.0	3.88
Crescent City L. H.	.....	.....	.....	12.57	Long Beach * ..	78	35	52.2	.....
Davisville.....	84	37	52.6	6.80	Los Angeles * ..	90	40	55.4	7.25
Davisville b.....	80	38	59.5	3.94	Los Banos * ..	80	38	52.2	2.19
Delano * ..	80	34	53.5	2.43	Los Gatos * ..	80	38	52.2	8.18
Delta * ..	78	35	51.9	11.90	Los Gatos b.....	76	35	49.1	9.15
Downey * ..	90	40	59.9	8.75	Mammoth Tank.....	93	40	61.5	1.17
Drytown.....	77	31	48.8	9.15	Mar Island L. H.	.....	.....	.....	3.67
Duarte.....	97	34	54.5	11.20	Mariposa * ..	79	26	45.4	11.67
Dunnigan * ..	74	34	47.9	4.64	Marinares * ..	68	30	50.3	4.47
Dunsmuir * ..	70	25	43.1	13.30	Marysville a * ..	85	32	49.3	3.68
East Brother L. H.	.....	.....	.....	2.14	Maxwell.....	.....	.....	.....	3.69
Edgewood.....	66	17	36.0	2.90	Menlo Park * ..	89	36	51.5	4.33
Edmonton * ..	63	15	35.0	13.89	Merced * ..	82	40	54.8	3.42
El Casco * ..	83	30	56.2	.....	Middletown * ..	85	31	49.0	3.39
Eldorado * ..	81	33	49.8	8.02	Mills College.....	.....	.....	.....	6.00
El Verano * ..	75	37	52.1	8.52	Milton (near) * ..	77	37	52.7	7.51
Emigrant Gap * ..	30	17	33.5	10.05	Modesto * ..	89	39	59.2	4.24
Esposito * ..	76	36	52.9	3.14	Mohave * ..	80	28	50.4	1.53
Evergreen.....	.....	.....	.....	5.75	Mokelumne Hill * ..	.....	32	45.6	11.83
Exeter * ..	81	34	55.0	3.85	Monson * ..	83	39	53.6	3.61
Fall Brook * ..	83	37	51.1	8.06	Montague * ..	75	30	47.2	0.80
Farmington * ..	82	35	50.3	6.16	Monterey * ..	74	38	53.5	5.78
Felton * ..	78	29	51.8	12.52	Mountain View.....	.....	.....	.....	4.40
Fernando * ..	86	34	52.4	6.93	Mount Glenwood * ..	75	40	53.2	7.60
Florence * ..	85	41	54.0	6.79	Napa City a * ..	78	32	51.9	5.31
Florin * ..	83	31	52.8	2.77	Napa City b.....	77	34	51.9	4.31
Folsom City a * ..	80	40	54.4	0.86	National City † ..	79	33	54.6	6.50
Folsom City b * ..	83	36	54.2	6.93	Needles a † ..	94	38	62.5	0.55
Fort Bidwell.....	66	9	35.1	1.60	Needles b † ..	87	.....	59.5	.....
Fouts Springs * ..	50	16	31.6	5.17	Nevada City † ..	75	32	43.2	12.75
Freese * ..	82	34	54.1	3.09	New Almaden * ..	80	40	52.7	6.78
Fruto * ..	75	36	53.0	6.40	Newark * ..	81	39	55.8	4.66
Galt * ..	80	38	53.6	4.49	Newcastle a † ..	77	30	48.7	7.21
Georgetown † ..	78	24	44.0	17.69	Newcastle b * ..	76	30	49.0	5.36
Hilroy * ..	85	36	55.1	.....	Newhall * ..	88	32	52.0	7.90
Hirard * ..	75	30	43.2	3.43	Newman * ..	80	38	55.5	4.73
Helen Ellen * ..	78	30	54.0	11.64	Niles * ..	82	40	51.6	5.95
Hendora.....	.....	.....	.....	14.56	Nordhoff † ..	85	29	49.6	7.75
Joshen * ..	74	32	51.8	2.95	Norwalk * ..	77	45	58.8	5.99
Grass Valley a.....	.....	.....	.....	12.40	Oakdale * ..	81	30	48.3	5.29
Grass Valley b.....	71	27	42.1	11.93	Oakland b * ..	74	38	53.9	5.22
Gridley * ..	78	32	48.0	5.24	Oleta * ..	75	29	45.3	11.40
Guinda.....	.....	.....	.....	4.10	Ontario * ..	89	36	52.4	7.37
Haywards * ..	70	38	50.0	5.20	Orangevale † ..	76	30	51.8	5.75
Hollister.....	82	30	51.6	4.25	Orland * ..	80	36	52.1	5.75
Hornbrook * ..	75	24	44.5	0.30	Oroville a * ..	84	42	53.2	6.47
Humboldt L. H.	.....	.....	.....	9.59	Oroville b.....	90	37	57.4	6.47

Meteorological record of voluntary observers, &amp;c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>California—Cont'd.</i>				<i>Ins.</i>	<i>California—Cont'd.</i>				<i>Ins.</i>
Pajaro .....	75	37	53.4	6.63	Vacaville .....	75	37	53.3	5.00
Palermo .....	77	31	50.4	3.81	Valley Springs .....	85	33	53.6	7.32
Palm Springs .....	96	43	63.3	1.18	Ventura .....	82	36	54.9	8.19
Pasadena .....	85	30	51.0	10.47	Vina .....	76	35	51.9	4.62
Paso Robles .....	75	33	45.6	6.28	Walnut Creek .....	86	31	49.9	3.94
Petaluma .....	78	33	52.5	6.41	West Butte .....	72	34	53.3	3.33
Piedras Blancas L.H.				5.57	Westley .....	75	39	55.0	2.56
Pigeon Point L.H.				4.42	Wheatland .....	86	36	51.3	3.90
Placerville a .....	78	35	48.5	12.29	Whittier .....	82	41	59.0	7.35
Placerville b .....	77	32	45.4	12.39	Williams .....	74	36	52.9	3.66
Pleasanton a .....	87	33	51.6	3.23	Willows .....	73	33	49.8	4.01
Pleasanton b .....	81	30	50.5	3.75	Willow .....	75	37	51.4	4.05
Pt Ano Nuevo L.H.				7.45	Winters .....	90	31	53.5	4.93
Point Arena L.H.				10.91	Woodland .....	75	42	54.9	4.93
Point Bonita L.H.				5.17	Yuba City .....	76	22	41.6	1.53
Pt Conception L.H.				6.66	Yuba City .....	86	44	55.1	3.75
Pt Fermin L.H.				6.30					
Point Hueneme L.H.				4.21	<i>Colorado.</i>				
Point Loma L.H.				3.91	Abbott .....	86		53.0	0.43
Point Montara L.H.				3.58	Agate .....	86		53.0	0.20
Point Pinos L.H.				2.93	Alma .....	52	15	19.8	0.50
Point Reyes L.H.				5.82	Amherst .....				0.45
Point Sur L.H.				8.20	Arboles .....				1.09
Pomona .....	85	32	53.5	3.68	Avoca .....				0.87
Porterville a .....	82	36	59.4	4.67	Bennet .....	86	12	39.1	0.50
Porterville b .....				8.25	Box Elder .....				0.11
Poway .....				7.03	Breckenridge .....	80	14	19.4	5.20
Puente .....	85	38	54.3	5.40	Brush .....	80	4	35.3	0.08
Ravenna .....	83	32	49.2	5.85	Byers .....	80	18	40.9	0.25
Red Bluff .....	79	37	52.2	9.17	Castle Rock .....	80	1	35.6	0.70
Redding a .....	78	32	49.3	12.16	Cheyenne Wells .....	80	0	35.7	1.0
Redding b .....	74	32	49.2	7.22	Chivington .....				0.35
Redlands a .....	86	36	51.9	6.26	Climax .....	44	8	11.8	6.90
Redlands b .....	77	36	50.2	7.40	Collbran .....				2.34
Reprea .....	94	32	50.0	8.26	Como (near) .....	55	4	31.5	0.43
Rialto .....				3.31	Cope .....	82	11	36.9	0.57
Rio Vista .....	92	32	51.5	5.74	Cumbres .....	47	11	20.6	6.00
Riverside a .....	81	37	55.9	4.98	Deer Trail .....	78	19	33.6	1.00
Riverside b .....				2.31	Delta .....	80	9	38.7	0.40
Rocksbluff .....	74	39	53.5	5.77	Dillon .....				1.94
Roe Island L.H.				4.15	Downing .....	84	7	39.4	1.0
Rumsey .....	73	26	47.7	3.21	Dumont .....	65	2	29.0	0.50
Sacramento a .....	70	34	54.5	3.21	East Dale .....				0.50
Sacramento b .....	68	40	55.0	3.21	First View .....	82		38.3	0.02
Salinas a .....	79	30	51.1	5.12	Fort Collins .....	78	2	35.2	0.14
Salinas b .....	70	38	47.7	5.12	Fort Collins (near) .....				0.10
Salton .....	98	40	66.1	0.22	Fruita .....	77	8	39.8	0.39
San Ardo a .....	84	35	52.0	3.94	Garnett .....				0.06
San Ardo b .....	84	28	49.6	5.86	Gaynor .....	75	3	30.0	0.15
San Bernardino .....	89	30	53.8	8.00	Georgetown .....	44	0	27.8	0.42
San Gabriel .....	86	36	50.3	3.40	Glen Eyrie .....	74	8	36.9	0.07
Sanger Junction .....	85	35	53.3	6.01	Gold Hill .....	65	4	30.4	0.20
San Jacinto .....	91	29	51.6	5.12	Grand Junction .....	78	19	42.4	0.18
San Jose a .....	78	38	53.1	4.90	Greeley .....	75	1	37.0	0.63
San Jose b .....	81	30	52.3	8.90	Greenhorn .....	75	7	38.0	0.60
San Luis L.H.				9.33	Hugo .....	72	18	34.6	0.70
San Luis Obispo .....				6.49	Hugo (near) .....	79	3	35.7	0.02
San Mateo .....	76	39	54.4	3.99	Husted .....	81	3	37.1	0.29
San Miguel .....	84	32	51.2	6.02	Idaho Springs .....	69	7	32.5	0.30
San Pedro .....	83	42	56.6	7.53	Kirk .....				0.12
Santa Barbara a .....	82	38	53.1	6.94	Kit Carson .....	88	13	36.9	0.12
Santa Barbara b .....	70	49	50.2	4.79	La Jara .....	74	3	34.4	0.12
Santa Clara .....	77	37	51.2	11.03	Lamar .....	88	4		0.16
Santa Cruz a .....	81	35	56.8	9.54	La Porte .....				0.12
Santa Cruz b .....	81	36	51.9	10.60	Las Animas .....	84	3	39.8	0.05
Santa Cruz L.H.				6.84	Lavender .....	70	2	36.9	1.86
Santa Margarita .....	75	35	46.0	7.40	Lay .....	62	2	28.9	3.25
Santa Maria .....	84	34	52.7	6.81	Le Roy .....	83	5	35.0	0.87
Santa Monica .....	80	40	53.9	3.32	Livermore .....	73	9	34.7	0.35
Santa Paula .....	82	32	51.3	12.36	Longmont .....	80	8	37.4	0.19
Selma .....	84	33	53.6	13.93	Loveland .....	67	4	31.6	0.10
Shasta .....	70	30	39.9	8.94	Meeker .....				0.16
Shelter Cove .....	64	36	47.9	9.78	Middle Box Elder .....	88	12	40.4	0.15
Shingle Springs .....	63	32	52.5	8.94	Minneapolis .....	69	4	30.1	0.15
Sims .....	75	23	42.8	2.77	Monte Vista .....	69	4	31.0	0.04
Sisson .....	68	16	38.7	3.06	Monte Vista b .....	72	4	31.0	0.04
Soledad .....	80	36	51.3	3.01	Moraine .....	59	1	27.9	1.88
Sonoma .....	79	34	48.4	3.01	Pagoda (near) .....	58	11	38.8	4.60
S. E. Farrallon L.H.				3.01	Paonia .....				0.57
South Vallejo .....	75	36	56.6	2.59	Parachute .....	74	3	32.0	2.01
Spadra .....	90	36	52.2	2.66	Red Cliff .....				3.41
Stockton a .....	78	34	52.6	14.50	Rico .....				5.20
Stockton b .....	78	37	56.6	3.51	River Bend .....	80	20		0.20
Summit .....	44	5	27.7	33.8	Robb .....	50	2	33.8	0.70
Suisun City .....	79	39	53.9	41.7	Rocky Ford .....	88	4	41.7	0.80
Susanville .....	65	10	38.4	1.00	Saint Cloud .....				1.00
Sutter Creek .....	72	24	43.6	0.15	San Acacia .....				0.15
Tahachapi .....	74	30	38.4	0.00	Sanborn .....				0.00
Tehachapi b .....	74	14	40.2	0.00	San Luis .....	72	3	30.4	0.60
Tehama .....	80	37	52.5	0.60	Scissors .....				0.60
Templeton .....	83	35	53.4	0.60	Seibert .....				0.31
Towles .....	74	22	41.0	0.23	Sheridan Lake .....				0.23
Tracy .....	74	31	53.3	0.50	Smoky Hill Mine .....	71	5	33.4	0.50
Trinidad L.H.				8.96	Springfield .....				0.10
Tropico .....	86	30	54.4	0.90	Stamford .....	55	4	25.7	0.90
Truckee .....	58	10	30.4	2.55	Sunnyside .....	60	1	26.5	0.82
Tulare a .....	84	34	52.2	3.02	Surface Creek .....	72	9	37.0	1.05
Tulare b .....	68	32	54.6	3.37	Table Rock .....	72	3	32.4	0.51
Turlock a .....	80	33	56.1	2.73	Thon .....	86	5	37.0	0.31
Turlock b .....	76	29	48.5	8.30	T. S. Ranch .....	76	12	38.6	1.04
Ukiah .....	72	29	45.8	5.47	Twin Lakes .....				1.0
Upper Lake .....	82	31	47.6	4.54	Villa Grove .....				0.05
Vacaville a .....	75	37	52.9						

Meteorological record of voluntary observers, &amp;c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>Colorado—Cont'd.</i>					<i>Georgia—Cont'd.</i>				
Willet †				0.95	Marshallville †	78	22	54.7	5.08
Ward District				0.64	Milledgeville †	77	21	53.7	4.10
Watkins *1	80	15	41.3	0.10	Millen †	84	22	54.9	2.27
Wilde				0.25	Morgan †	81 <sup>h</sup>			5.88
Yuma				0.70	Mount Vernon †				3.12
Zuck				0.24	Piscola	82	27	58.6	6.15
<i>Connecticut.</i>					<i>Idaho.</i>				
Canton	50	8	31.0	4.69	Boise Barracks	74	14	38.7	1.30
Colchester	51	10	32.2	5.48	Bonanza City †	50	18	22.6	1.76
Falls Village				3.05	Fort Sherman	54	5	33.9	3.35
Hartford †				5.40	Garden Valley †	56	6	32.1	2.97
Hartford †	54	10	33.4		Henry's Lake †	52	22	24.8	0.75
Lake Konomoc				5.14	Kootenai †	52	9	32.2	1.93
Lebanon				4.70	Martin †	50	3	26.2	2.66
Middletown	59	10	34.0	5.39	Moscow †	59 <sup>h</sup>	15	34.5	1.94
New Hartford a *†1	43	2	24.2	4.51	Payette †	72	19	49.3	1.32
New Hartford b				5.05	Ruthsburg *†1	61	4	35.5	1.20
North Franklin				5.00	<i>Illinois.</i>				
N. Grosvenor Dale †	52	1	29.8	3.99	Aurora a	69	8	32.8	2.69
Norwalk †	52	3	31.4	4.10	Aurora b †	71	7	34.0	3.39
Southington *1	48	15	32.1	5.56	Bloomington †	68 <sup>h</sup>	5	37.8	3.11 <sup>h</sup>
South Manchester				4.15	Bushnell †	76	7	37.2	2.11
Stevenson				5.05	Carlinville †	82	10	40.6	3.68
Storrs †	49	6	30.3	4.67	Carlyle				2.73
Thompson †	47	8	29.4		Collinsville †	78	10	43.2	5.21
Voluntown †1	53	11	33.0	5.39	Decatur *†1	72	7	37.1	3.82
Wallingford †				5.86	Dixon †	70	6	32.5	2.83
Waterbury	49	13	32.4	4.83	East Peoria †	77	9	38.2	3.38
West Simsbury				3.92	Effingham †	80	2	36.4	4.27
<i>Delaware.</i>					<i>Indiana.</i>				
Dover †	71	13	40.2	3.34	Fairmount †	100		34.7	4.25
Kirkwood *3	68		35.8		Flora †	80	11	42.2	4.72
Millboro †	72	12	39.7	3.09	Fort Sheridan †	57	8	30.7	1.95
Seaford †1	72	12	40.4	3.28	Galva †	77	4	34.9	2.88
<i>District of Columbia.</i>					<i>Iowa.</i>				
Dist'ng Reserv' r *3	61	17	40.6	3.32	Goconda †	75	9	47.2	2.43
Long Bridge †				2.31	Greenville †1	80	9	41.6	3.54
Rec'ng Reserv' r *3	60	17	40.4	2.26	Griggsville †	82	8	39.2	6.22
West Washington †	71	15	43.2	1.71	Havana †	79	10	40.5	2.94
<i>Florida.</i>					<i>Kansas.</i>				
Amelia †	79	28	57.8	7.17	Hennepin †	67	8	37.2	
Avon Park *†1	85	37	66.3	2.88	Jordan's Grove †	78	10	44.2	2.74
Bristol †	88	26	59.8	8.77	Kankakee †	70	11	34.0	1.13
Brooksville †	84	30	62.4	3.44	Lagrange †	70	10	34.2	2.15
Chattahoochee					McLeansboro *1	81	10	43.6	3.25
Landing †				7.66	Martinsville †	76	16	41.4	3.99
Clermont †	87	34	64.1	4.79	Mascoutah *3	76	9	41.8	3.50
De Land †	54	30	61.8		Monmouth †	78	5	36.3	3.48
Eustis †	87	30	62.4	3.26	Mount Carmel †				4.00
Fort Meade †	86	31	64.7	3.58	Muddy Valley *3	74 <sup>h</sup>	10 <sup>h</sup>	41.6 <sup>h</sup>	2.39
Grasmere	87	31	64.4		New Haven †				2.01
Green Cove Sp'gs †	85	30	63.5	7.65	Olney a †1	79	10	44.1	4.05
Homeland †	88	31	63.0	2.74	Olney b *1	79	10	39.5 <sup>h</sup>	5.04
Hypoluxo *†1	81	44	70.9	3.94	Oregon †	77	8	36.0	2.86
Kissimmee †		31		1.89	Oswego *1	66	8	32.5	2.68
Lake City †	86	32	63.5	9.95	Ottawa †1	76	8	35.4	3.30
Manatee †	85	33	64.0	4.06	Palestine †1	78	13	41.4	3.40
Merritts Island †	85	37	66.6	2.95	Pana *†1	80	8	40.5	3.77
Moseley Hall †	78	26	60.0	9.30	Peoria †	77	8	39.4	3.01
Mullet Key †1	80	36	63.6	3.42	Philo †1	77	10	36.4	3.87
Myers †1	86	40	67.2	1.66	Rantoul *1	74	9	36.7	2.60
New Smyrna †	86	32	62.6	6.11	Riley †	64	6	30.6	1.82
Ocala *†1	85	27	61.9	5.26	Rockford †	65	7	32.2	3.21
Orange City †1	89	32	63.6	5.41	Rushville	82	8	38.4	3.77
Orlando †				2.15	Saint John *1	78	14	47.8	3.69
Oxford *†1	86	30	61.5	5.23	Shawneetown †				2.08
Plant City †	80	31	66.0	4.40	Sycamore *1	64	9	32.4	2.22
St. Andrews Bay †	78	28	59.0	7.29	Tuscola *1	75	10	42.6	3.20
Saint Francis H'ks.	84	28	60.5	8.22	Walnut †	73	7	35.7	3.13
St. Petersburg †1	85	34	64.4	4.42	Watska †				34.6
Tallahassee †	78	26	56.9	6.87	White Hall *4	73	11	38.0	4.62
Tarpon Springs †	88	32	64.8	5.05	Winnebago †1	66	5	31.1	2.20
<i>Georgia.</i>					<i>Indiana.</i>				
Adairsville †	79	17	51.0	3.94	Angola †	70	9	34.6	2.81
Alapaha †	82	24	57.1	4.93	Ashboro †	72	12	41.9	2.75
Albany †	80	30	57.2	4.65	Bedford †	76	12	41.2	3.35
Americus †	86	20	55.4	3.92	Blairville †	77	11	42.4	3.20
Athens a †	77	21	51.2	2.47	Cantbridge City †	72	12	38.8	2.47
Athens b †	78	19	51.4	2.72	Columbia City *1	68	11	35.6	2.67
Blakely *†8	83	28	57.6	6.64	Columbia *3	74	15	41.0	1.87
Brag †	83	24	56.2	3.34	Connersville †	75	12	40.2	1.61
Camak †				2.91	Degonia Springs *6	73	12	44.7	1.67
Canton †				3.33	Delphi	69	12	38.7	3.64
Columbus †	79 <sup>h</sup>	23 <sup>h</sup>	56.0 <sup>h</sup>	3.22	Evansville †				2.21
Cordele †	87	21	56.3	5.50	Farmland	71	12	38.5	2.59
Dahlonega †	82	16	50.8	3.94	Franklin *1	76	14	40.4	2.03
Darien †	86	25	59.2	4.06	Hammond †	60	8	35.2	1.39
Diamond †	78	12	49.4	3.99	Hawpacth *†1	64	9	35.8	3.83
Dublin †	81	28	55.0	3.63	Huntingburg *3	68	12	43.4	2.85
Elberton †	80	19	51.8	2.85	Huntingburg †				1.90
Fleming †	85	26	55.0	4.06	Irvington *†8		16	38.3	3.63
Forysth *1	88	23	57.8	2.51	Jeffersonville †	78	14	44.7	2.27
Gainesville †	78	18	50.4	3.71	Kokomo *†1	72	8	37.8	2.07
Gillsville *†1	78	18	51.6	2.37	Laconia *1	79	11	44.0	2.18
Hawkinsville †	83	16	54.2	5.01					
Hephahbah *†3	72	26	55.0	2.56					
Homerville †	83	28	58.2	6.01					
Lafayette †	70	18	50.5	2.94					
Lagrange *†1	80	19	53.0	6.46					
Lincolnton †	83	21	52.4	1.86					
Louisville †	79	22	54.2	3.18					
Lumpkin †	79	22	56.0	5.44					
McArthur	85	23	58.2	2.07					
Macon †				2.75					
Marietta †1	80	17	50.5	3.39					



Meteorological record of voluntary observers, &amp;c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean.			Max.	Min.	Mean.	
<b>Indiana—Cont'd.</b>					<b>Kansas.</b>				
Lafayette f.....	74	12	38.3	4.12	Abilene f.....	95	8	44.8	0.89
Logansport f.....	67	10	35.6	2.23	Allison f.....	86	0	33.5	0.14
Marengo f.....	78	18	46.7	3.00	Altoona f.....	76	11	40.9	2.31
Marion f.....	72	13	40.9	2.76	Athol f.....	80	7	39.2	2.39
Markle f.....	70	7	37.0	2.22	Beloit f.....	83	7	36.1	0.85
Maury f.....	74	9	38.5	1.71	Bucklin f.....	86	10	31.1	0.00
Michigan City f.....	70	12	36.7	3.90	Buffalo Park f.....	82	10	40.0	0.70
Mount Vernon f.....	76	11	44.2	2.66	Cawker City f.....	83	7	36.1	0.03
Mount Vernon b.....	76	11	44.2	2.66	Colby f.....	81	3	44.0	0.00
Muncie f.....	72	14	43.6	6.52	Coldwater f.....	88	0	37.1	0.00
New Albany f.....	76	12	44.9	2.04	Collyer f.....	80	10	43.4	2.39
Point Isabel f.....	66	10	38.3	3.49	Columbus f.....	93	5	41.3	0.37
Princeton f.....	78	12	42.5	3.49	Cunningham f.....	82	9	42.1	0.32
Rockville f.....	76	11	38.9	3.79	Downs f.....	82	9	42.1	1.54
Rushville f.....	76	12	41.0	2.90	Elco f.....	86	2	41.1	0.90
Seymour f.....	76	12	41.0	2.90	Eldorado f.....	86	2	41.1	0.00
Shelbyville f.....	76	12	41.0	2.90	Emporia f.....	80	10	42.2	0.00
Terre Haute f.....	75	10	41.4	3.81	Englewood f.....	93	2	44.0	0.55
Union City f.....	64	14	36.6	2.67	Eureka Ranch f.....	88	7	38.6	0.00
Valparaiso f.....	62	12	35.1	1.33	Fort Riley f.....	84	8	40.3	0.80
Vevay f.....	78	14	44.7	2.26	Gibson f.....	85	0	36.3	0.00
Worthington f.....	76	12	42.6	2.65	Gove City f.....	93	0	37.1	0.00
<b>Indian Territory.</b>					Grainfield f.....	87	6	40.1	0.00
Colbert f.....	76	12	42.6	2.65	Greensburg f.....	87	6	40.1	0.00
Eufaula f.....	76	12	42.6	2.65	Grenola f.....	83	9	45.2	3.00
Fort Supply f.....	95	5	46.5	0.20	Grinnell f.....	90	0	35.0	0.00
Gwendale f.....	78	12	46.2	2.81	Havensville f.....	81	3	37.2	1.40
Lehigh f.....	83	21	55.6	2.08	Hays City f.....	90	1	42.9	0.00
Purcell f.....	90	11	55.8	1.33	Hesston f.....	80	5	39.8	0.51
South McAlester f.....	84	18	53.6	1.12	Horton f.....	79	4	38.8	3.08
Tulsa f.....	84	18	53.6	1.12	Hutchinson f.....	85	7	44.4	0.10
<b>Iowa.</b>					Independence f.....	80	10	44.9	2.98
Algona f.....	66	4	28.4	2.20	Kansas City f.....	81	9	40.0	2.46
Alta f.....	61	8	26.7	2.60	Kellogg f.....	84	1	45.0	1.95
Amana f.....	71	3	32.3	2.52	Kiowa f.....	95	9	47.9	0.39
Ames f.....	73	5	30.1	2.04	La Crosse f.....	87	7	41.8	0.00
Ames (near) f.....	70	4	31.1	1.73	Lakin f.....	89	6	44.4	0.10
Atlantic f.....	74	3	31.0	1.58	Lawrence f.....	78	7	40.1	3.00
Audubon f.....	75	3	31.0	1.55	Lebo f.....	83	9	42.2	1.46
Belle Plaine f.....	73	2	31.5	2.49	Liberal f.....	90	1	42.9	0.00
Blakeville f.....	64	2	29.8	3.70	McAllister f.....	90	3	31.1	0.00
Blockton f.....	73	2	33.8	2.70	McPherson f.....	84	6	40.4	0.52
Bonaparte f.....	79	5	34.6	2.79	Manhattan f.....	87	6	39.7	0.99
Carroll f.....	67	2	30.1	1.75	Manhattan b.....	80	6	37.8	0.84
Cedar Falls f.....	67	2	31.1	2.78	Marion f.....	84	5	42.4	0.42
Cedar Rapids f.....	68	5	33.1	2.99	Marmaton f.....	80	8	38.0	2.08
Centerville f.....	76	2	35.8	1.10	Minneapolis f.....	87	3	40.2	0.72
Charles City f.....	62	12	26.5	2.51	Monument f.....	81	9	31.0	0.00
Clarinda f.....	74	2	32.9	1.73	Morland f.....	90	2	37.0	0.00
Clinton f.....	70	5	33.2	2.75	Morse f.....	79	7	38.9	2.57
College Springs f.....	79	0	33.7	1.80	Morton f.....	91	0	43.7	0.00
Corning f.....	74	0	35.2	2.31	Mount Hope f.....	83	10	44.6	0.75
Cresco f.....	58	9	28.3	2.77	N. England Ranch f.....	90	5	38.8	0.00
Decorah f.....	62	10	28.2	2.60	Oberlin f.....	83	7	45.0	2.83
Delaware f.....	65	0	27.8	2.31	Oswego f.....	83	7	45.0	2.83
Denison f.....	69	2	31.9	1.79	Page City f.....	60	17	37.5	0.38
Eagle Grove f.....	69	2	31.9	1.79	Phillipsburg f.....	88	2	37.4	0.00
Elkader f.....	67	4	30.5	2.15	Pleasant Dale f.....	89	5	38.5	0.00
Emmetsburg f.....	67	4	31.2	2.15	Quinter f.....	85	8	41.9	0.00
Fayette f.....	69	7	29.4	2.21	Rome f.....	82	10	45.9	1.59
Fort Madison f.....	70	9	39.5	3.98	Sedan f.....	81	5	45.0	2.83
Fulton f.....	66	5	32.3	4.40	Sharon Springs f.....	90	12	45.8	0.25
Glenwood f.....	84	2	37.9	0.97	Shields f.....	88	5	41.0	0.27
Grand Meadow f.....	73	2	31.4	1.96	Sterling f.....	87	6	45.0	0.27
Greenfield f.....	73	2	31.4	1.96	Syracuse f.....	85	1	37.8	0.00
Grinnell f.....	67	4	32.5	1.60	Topeka f.....	83	3	38.8	0.07
Grundy Center f.....	65	0	30.0	2.40	Tribune f.....	92	6	43.2	0.00
Hampton f.....	65	4	26.2	2.56	Ulysses f.....	88	0	37.1	0.00
Hawkeye f.....	71	1	33.8	0.63	Wa Keeney f.....	88	0	37.1	0.00
Hopeville f.....	68	5	32.8	2.81	Wakefield f.....	87	10	41.4	0.91
Hopkinton f.....	67	2	29.2	1.75	Wallace f.....	80	4	42.3	0.00
Independence f.....	74	2	35.0	0.80	Wallace b.....	84	10	40.7	0.95
Indianola f.....	72	4	34.6	2.82	Winona f.....	84	4	34.8	0.05
Iowa City f.....	72	4	34.6	2.82	Yates Center f.....	83	7	45.0	2.77
Iowa Falls f.....	65	6	26.6	2.22	<b>Kentucky.</b>				
Jefferson f.....	73	6	30.8	2.35	Bowling Green f.....	77	9	43.7	3.29
Keosauqua f.....	71	6	36.8	2.35	Burnside f.....	75	13	44.8	2.65
Larrabee f.....	62	7	26.9	2.47	Caddo f.....	78	14	47.2	5.59
Le Claire f.....	73	0	31.1	0.84	Canton f.....	76	17	47.2	1.75
Logan f.....	70	1	33.0	1.97	Carrollton f.....	72	20	44.0	1.47
Marshall f.....	75	0	32.7	2.56	Catlettsburg f.....	81	15	49.2	4.20
Maxon f.....	69	2	31.4	2.79	Earlington f.....	78	11	43.6	3.66
Meacham f.....	68	4	29.2	2.44	Eddyville f.....	78	11	43.6	3.66
Monticello f.....	70	3	34.8	2.13	Edmonton f.....	78	11	43.6	3.66
Mount Pleasant f.....	71	3	34.8	2.65	Falmouth f.....	78	11	43.6	3.66
Mount Vernon f.....	76	1	37.7	0.94	Frankfort f.....	75	11	47.4	4.63
Murray f.....	72	1	33.7	0.94	Franklin f.....	75	12	46.1	3.03
Osage f.....	75	1	33.5	1.23	Greensburg f.....	80	12	43.9	3.15
Oskaloosa f.....	74	4	33.8	1.90	Harrodsburg f.....	83	14	40.1	2.40
Panama f.....	70	2	30.3	1.10	Hendricks f.....	74	10	49.6	8.22
Richland f.....	70	2	34.3	3.03	Lagrange f.....	74	10	49.6	8.22
Sac City f.....	65	3	26.6	1.75	Lancaster f.....	81	15	43.0	1.97
Storm Lake f.....	59	3	27.4	2.60	Matlock f.....	80	10	42.8	2.58
Tipton f.....	77	2	33.8	3.09	Middleboro f.....	78	15	45.2	2.39
Vinton f.....	70	2	33.5	3.09	Mount Sterling f.....	80	12	41.4	3.04
Washington f.....	69	1	31.2	1.95	Munfordville f.....	77	11	44.0	2.08
Webster City f.....	72	6	36.6	2.70	Paducah f.....	80	11	49.7	2.13
Williams f.....	75	4	28.2	1.18	Pellville f.....	78	10	45.4	2.63
Winterset f.....	65	0	27.4	1.89	Richmond f.....	72	8	43.2	2.54

Meteorological record of voluntary observers, &amp;c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<b>Kentucky—Cont'd.</b>					<b>Massachusetts—Con.</b>				
Russellville*† <sup>1</sup>	74	10	46.4	2.63	Amherst Ex. St'n b.	52	4	30.4	3.66
Shelby City* <sup>1</sup>	78	14	45.4	3.41	Andover <sup>1</sup>	57	9	30.3	3.25
Shelbyville <sup>1</sup>	80	13	43.8	1.95	Ashland	53	8	31.0	2.07
South Fork† <sup>1</sup>	89	5	42.7	3.66	Beverly Farms	53	8	31.0	2.07
Springfield† <sup>1</sup>	89	5	42.7	3.66	Blue Hill (sum't). <sup>1</sup>	54	9	31.2	4.03
Versailles† <sup>1</sup>	74	12	44.0	2.63	Blue Hill (valley). <sup>1</sup>	54	5	31.0	4.17
West Point* <sup>1</sup>	74	12	44.0	2.63	Boston	54	5	31.0	4.17
Wickliffe*† <sup>1</sup>	70	10	40.9	2.94	Cambridge a	55	9	32.4	3.71
<b>Louisiana.</b>					Cambridge b.	54	9	32.1	3.50
Abbeville <sup>1</sup>	87	32	59.7	4.28	Chestnut Hill.	54	7	32.9	3.37
Alexandria†	80	25	54.6	1.62	Clinton	53	8	31.3	3.68
Amite†	86	30	62.0	4.28	Concord a†	54	3	30.5	3.03
Baton Rouge† <sup>1</sup>	82	30	58.7	5.65	Dudley <sup>1</sup>	53	8	29.9	3.37
Calhoun.	81	23	55.0	2.34	Egg Rock, Nahant.	51	13	30.9	3.32
Cameron†.	86	21	58.4	4.10	Fall River a <sup>1</sup>	53	12	34.1	4.88
Cheneyville†	81	32	59.6	1.54	Fiskdale	52	8	29.8	2.77
Clinton†	88	40	68.8	2.58	Fitchburg a* <sup>1</sup>	48	5	29.8	2.77
Coushatta a†	86	25	55.8	4.40	Fitchburg b.	52	5	29.7	3.24
Coushatta b†	86	25	55.8	4.40	Framingham	55	3	31.3	3.68
Davis	83	21	53.6	2.94	Gilbertville	51	5	30.7	3.32
Delhi†	84	21	53.6	2.94	Great Barrington <sup>1</sup> .	52	8	30.0	3.00
Donaldsonville†.	88	30	59.4	3.97	Groton a.	52	5	29.6	3.22
Emilie†	83	31	59.2	3.75	Groton b.	52	8	31.4	3.14
Farmerville	81	25	54.5	3.78	Hingham*	61	13	35.3	5.90
Franklin†	88	33	61.6	2.30	Hyannis* <sup>1</sup>	40	8	31.6	2.89
Girard†	88	33	61.6	2.30	Kendall Green* <sup>1</sup>	47	8	31.4	3.13
Grand Coteau <sup>1</sup>	82	34	59.5	3.83	Lake Cochituate.	57	6	31.4	3.83
Hammond†.	81	24	54.1	5.03	Lawrence	54	5	31.9	2.99
Homert	84	33	60.1	5.34	Leeds	50	2	29.0	3.15
Houma†	85	32	59.6	3.70	Leicester	48	6	28.4	9.14
Jeanerette	86	32	59.8	3.44	Leominster* <sup>4</sup>	48	8	28.4	3.19
Lafayette†	86	32	59.8	3.44	Long Plain* <sup>4</sup>	55	10	30.4	6.06
Lake Charles† <sup>1</sup> .	82	35	60.7	8.30	Lowell a	52	2	30.4	2.44
Lake Providence†.	84	33	56.2	2.30	Lowell b.	54	5	30.7	3.07
Lawrence†	78	41	61.4	4.25	Lowell c.	54	8	31.1	3.11
Liberty Hill	88	22	55.8	4.00	Lynn b.	47	1	27.7	3.70
Many†	80	29	57.5	1.95	Lynn b.	61	12	35.0	5.90
Maurepas	88	27	57.3	5.90	Mansfield* <sup>1</sup>	58	1	31.6	3.68
Melville†.	84	37	61.0	1.85	Medford	55	10	32.8	5.35
Monroe†	82	27	56.8	3.18	Middleboro	55	4	31.5	2.80
Natchitoches	86	27	56.1	3.31	Milton* <sup>1</sup>	56	10	32.8	5.35
New Iberia <sup>1</sup> .	81	35	60.0	1.39	Monroe	54	6	26.0	3.08
Opelousas†.	78	29	59.6	2.22	Monson <sup>1</sup>	55	8	30.9	3.31
Oxford* <sup>1</sup>	82	23	58.3	5.22	Mount Nonotuck	55	8	30.9	3.31
Paincourtville†.	88	31	55.3	3.25	Mystic Lake	55	10	32.8	5.35
Plain Dealing <sup>4</sup>	85	32	60.5	0.90	Mystic Station.	52	13	32.4	6.18
Plaquemine.	86	30	60.0	3.92	New Bedford a* <sup>1</sup>	52	13	32.4	6.18
Rayne†.	82	29	58.9	3.19	New Bedford b.	56	13	33.8	5.53
Roseland	83	30	60.6	4.57	Newburyport b.	57	11	33.8	5.53
Schriever†.	80	35	60.4	5.16	North Billerica <sup>1</sup> .	64	14	35.0	6.17
Shell Beach.	87	30	60.4	4.42	Plymouth* <sup>1</sup>	51	15	33.3	4.79
Sugar Ex. Station† <sup>1</sup>	84	32	60.1	3.81	Provincetown.	55	13	33.4	5.53
Thibodeaux.	85	17	53.4	1.69	Randolph	55	13	33.4	5.53
Wallace.	85	17	53.4	1.69	Roberts Dam	55	13	33.4	5.53
West End.	85	17	53.4	1.69	Roxbury	55	13	33.4	5.53
Winnboro	85	17	53.4	1.69	Royalston* <sup>1</sup>	52	12	32.5	3.34
<b>Maine.</b>					Salem b.	59	7	34.4	4.78
Bar Harbor	52	6	29.4	1.72	Somerset* <sup>1</sup>	57	10	32.8	5.77
Belfast*	47	9	29.4	2.05	South Dennis <sup>1</sup> .	50	10	31.8	3.70
Calais†	50	0	28.0	1.35	Springfield Army†.	56	10	33.4	5.83
Cornish* <sup>1</sup>	48	3	27.8	2.08	Taunton a†.	56	10	33.4	5.83
East Machias†.	52	3	29.1	1.09	Taunton b.	56	8	33.8	4.75
Easton†	44	4	23.8	1.09	Taunton c.	55	6	32.6	5.64
Fairfield.	46	5	24.4	2.49	Taunton d <sup>1</sup>	55	8	32.7	3.83
Farmington†	40	12	25.4	2.69	Wakefield	54	6	32.2	4.21
Fort Kent†.	50	20	18.4	0.74	Waltham	54	6	32.2	4.21
Gardiner†.	49	3	27.8	3.18	Wayland	54	4	29.6	2.96
Houlton†.	45	14	22.9	0.99	Webster	52	5	29.6	3.70
Indian Stream	49	11	23.1	2.36	Wellesley	52	5	29.6	3.70
Kents Hill	48	2	25.5	2.95	Westboro†.	53	1	32.8	2.70
Lewiston <sup>1</sup>	48	1	27.5	2.78	Williamstown <sup>1</sup> .	50	8	30.1	1.39
Mattawamkeag* <sup>5</sup>	50	20	23.3	1.09	Winthrop	54	11	32.2	2.71
Petit Menan* <sup>1</sup>	43	10	30.4	1.09	Worcester a.	54	9	30.8	3.90
Presque Isle.	45	14	21.8	1.09	Worcester b.	53	10	31.6	3.90
West Jonesport* <sup>1</sup>	52	2	26.1	1.09	<b>Michigan.</b>				
<b>Maryland.</b>					Adrian	67	9	34.2	2.43
Barren Cr'k Sp'gs† <sup>1</sup>	73	15	40.8	3.55	Albion <sup>1</sup>	61	10	35.4	3.83
Boethscherville* <sup>1</sup>	64	16	39.3	2.40	Allegan	64	2	33.0	3.16
Cambridge	68	19	44.4	3.60	Alma*	53	5	27.3	2.96
Cumberland a†.	64	16	39.2	1.00	Ann Arbor <sup>1</sup> .	57	6	32.2	2.21
Cumberland b.	69	19	42.0	1.25	Arbela*	57	6	32.2	2.21
Darlington†.	62	12	38.0	2.10	Ball Mountain	58	4	29.0	1.89
Denton† <sup>1</sup>	70	15	42.9	3.27	Bear Lake	59	12	26.6	3.02
Easton†.	66	15	41.0	3.44	Bellaire.	53	16	23.4	1.32
Edgemont	60	10	37.3	1.00	Benton Harbor.	66	7	34.8	3.93
Fallston* <sup>1</sup>	60	11	37.7	1.55	Berrien Springs a* <sup>1</sup>	66	12	35.6	4.53
Fenby* <sup>1</sup>	61	12	35.5	1.85	Berrien Springs b.	66	12	35.6	4.53
Frederick <sup>1</sup>	60	16	39.8	1.64	Birch Run	57	3	30.4	3.01
Glyndon <sup>1</sup>	60	10	37.0	1.67	Birmingham <sup>1</sup> .	62	8	32.2	1.95
Great Falls* <sup>2</sup>	60	18	40.0	1.70	Boon <sup>1</sup>	50	9	24.5	3.04
Jewell <sup>2</sup>	62	18	42.4	2.80	Bronson	65	7	34.0	3.23
Leonardtown†.	72	16	42.5	2.68	Brown City	59	3	26.8	0.80
McDonogh	62	15	40.0	2.24	Caldwell	49	3	25.4	1.71
Mt. St. Mary's Col'† <sup>1</sup>	62	12	38.4	2.42	Calumet	48	3	19.8	2.29
New Market* <sup>1</sup>	62	16	36.9	1.90	Charlevoix.	56	3	24.4	1.58
Salisbury†.	70	18	41.1	2.87	Clinton	66	8	33.7	1.90
Solomons <sup>1</sup>	70	18	41.1	2.87	Crystal Falls	48	11	21.0	1.33
Sunnyside* <sup>1</sup>	70	6	34.0	1.24	Evart	51	10	25.5	1.25
Taneytown†.	60	10	37.3	1.00	Fairview	60	7	30.2	2.03
Westminster* <sup>1</sup>	63	13	36.4	1.35	Fitchburg.	58	5	31.0	4.20
Woodstock <sup>1</sup>	58	13	39.0	1.52	Flint	61	0	30.4	2.69
<b>Massachusetts.</b>					Gaylord.	49	12	23.8	0.97
Adams a.	59	7	31.8	1.00	Glenwood.	54	1	31.4	3.55
Amherst <sup>1</sup>	51	5	31.3	3.25	Grape	66	10	35.2	1.77
Amherst Ex. St'n a <sup>1</sup>	51	3	30.4	3.80	Grayling	52	7	24.4	1.30

## Meteorological record of voluntary observers, &amp;c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>Michigan—Cont'd.</i>	0	0	0	<i>Ins.</i>	<i>Mississippi—Cont'd.</i>	0	0	0	<i>Ins.</i>
Hanover	65	8	34.4	3.58	Macon	81	18	52.2	3.32
Harbor Springs	54	1	24.7	1.70	Okolona	84	21	52.6	2.11
Harrison	45	2	27.0	2.42	Palo Alto	79	18	51.7	2.96
Harrisville	54	1	24.4	2.61	Pontotoc	84	21	55.2	2.84
Hart	55	2	29.8	2.85	Port Gibson	82	17	51.4	2.26
Hastings	63	6	31.8	3.21	University	88	20	53.2	3.24
Hayes	56	3	27.9	...	Vaiden	80	26	56.6	1.71
Highland Station	...	...	...	2.13	Washington	83	19	51.8	3.00
Hillsdale	65	8	32.1	0.74	Waynesboro	85	23	54.4	2.67
Howell	61	4	31.2	2.83	Woodville	83	32	58.9	3.05
Jeddo	57	1	28.8	0.77	Yazoo City	...	...	...	4.30
Kalamazoo	65	11	33.5	2.89	<i>Missouri.</i>	...	...	...	...
Lansing	63	6	32.2	3.78	Akron	81	8	42.7	1.78
Lathrop	50	14	20.1	0.93	Appleton City	81	8	42.7	3.25
Lewiston	49	4	25.5	1.55	Arthur	78	8	39.5	1.84
McMillan	47	20	21.4	2.00	Bethany	78	5	35.5	1.84
Madison	63	8	33.2	2.40	Big Piney	81	6	41.0	1.60
Marshall	64	4	33.3	2.40	Brunswick	83	16	48.7	3.88
Mayville	56	2	28.2	2.71	Bryant	83	16	48.7	4.77
Montague	59	4	30.6	...	Canton	77	9	40.2	2.22
Mottville	66	7	34.8	3.65	Carthage	73	1	36.4	3.92
Noel	64	6	33.2	3.23	Conception	73	1	36.4	1.10
North Marshall	64	1	30.0	3.90	Cowdell	80	6	35.7	1.90
Olivet	63	3	30.6	2.95	Dadeville	81	4	42.8	3.51
Ovid	57	5	30.0	3.31	Dixon	81	4	42.8	3.51
Parkville	...	...	...	4.05	East Lynne	76	10	37.2	3.14
Rawsonville	60	10	33.4	2.55	Edina	77	6	41.1	3.96
Rockland	63	6	32.7	0.50	Eight Mile	82	6	41.7	3.56
Romeo	58	5	31.0	1.42	Edge Hill	82	10	41.7	1.64
Saint Ignace	46	10	22.2	2.02	Eldon	82	10	41.7	1.64
Sand Beach	58	3	29.3	0.51	Emma	84	8	41.2	2.45
Stockbridge	...	...	...	2.99	Farmersville	80	10	43.9	5.03
Thornville	54	6	31.6	1.33	Fox Creek	80	10	43.9	5.03
Vandalia	62	8	33.8	3.55	Fulton	75	8	43.6	4.67
Washington	62	3	31.8	1.33	Guineville	76	5	38.8	2.00
Williamston	56	9	33.9	2.40	Gallatin	82	8	40.3	2.50
Ypsilanti	67	7	32.8	2.18	Glensted	70	10	43.3	3.12
<i>Minnesota.</i>	...	...	...	...	Gordonville	78	5	43.1	3.69
Ada	40	27	8.2	0.85	Gorin	78	5	43.1	3.69
Albert Lea	61	11	23.9	2.61	Grove Dale	83	2	40.5	3.11
Alexandria	48	22	16.1	...	Hastain	80	5	43.0	3.33
Alexandria	48	22	16.1	...	Humansville	82	2	43.0	3.05
Alma City	56	18	23.1	2.68	Irena	78	5	43.2	4.78
Bingham Lake	60	14	22.3	0.35	Ironton	82	10	44.8	1.62
Bird Island	55	15	20.5	1.34	Jefferson City	80	8	44.2	2.60
Blooming Prairie	59	20	22.3	2.49	Lamar	80	7	36.8	1.81
Caledonia	56	8	25.3	3.05	Langdon	82	3	43.8	3.36
Cambridge	50	20	21.7	1.26	Lebanon	80	9	40.7	1.73
Camden	61	13	23.4	2.34	Lexington	80	10	41.1	2.66
Clear Lake	48	10	20.1	1.41	Liberty	86	10	39.6	3.50
Collegeville	51	10	24.7	0.87	McCune	77	6	45.6	2.68
Crookston	52	28	12.2	0.50	Malden	71	6	45.6	2.68
Farmington	52	16	22.2	2.43	Mansfield	83	8	42.3	2.80
Fergus Falls	47	20	18.2	1.00	Marble Hill	85	8	39.7	2.68
Fort Ripley	...	...	...	0.43	Marshall	78	14	40.6	3.25
Grand Meadow	51	13	22.1	1.55	Mexico	81	5	45.4	3.31
Granite Falls	56	19	21.1	1.57	Mine La Motte	72	7	37.0	1.62
Holland	61	15	20.5	1.44	Mount Vernon	83	7	45.0	2.45
Kimbria	62	11	23.1	2.45	New Boston	73	2	34.8	3.32
L Winnibigoshish	52	13	18.9	1.51	New Hartford	80	9	42.0	3.45
Leech Lake	54	25	18.0	1.78	New Haven	84	12	41.6	3.13
Long Prairie	50	19	16.2	1.30	New Palestine	...	...	...	...
Maple Plain	49	14	21.7	2.31	Oakfield	81	8	43.8	5.02
Minneapolis	50	12	22.5	1.05	Oak Ridge	75	8	42.3	2.80
Minneapolis	49	12	23.4	...	Olden	78	5	46.2	4.23
Minnesota City	57	8	26.7	...	Oregon	81	8	37.2	2.32
Montevideo	50	19	20.6	2.09	Oregon	80	8	36.8	2.07
Morris	49	21	18.7	1.17	Oto	...	...	...	...
Northfield	51	11	23.2	...	Palmyra	83	8	38.4	3.77
Ortonville	...	...	...	3.50	Paris	85	0	43.8	1.81
Park Rapids	48	22	16.3	1.58	Pickering	85	0	43.8	1.81
Pine River	48	19	16.8	0.94	Platte River	76	8	34.8	2.17
Pokegama Falls	51	30	18.6	1.35	Poplar Bluff	75	9	45.6	3.29
Redwood Falls	57	14	24.2	0.48	Princeton	74	5	35.4	2.28
Rochester	58	8	22.8	3.48	Rea	64	7	34.5	1.95
Saint Charles	57	9	24.0	2.25	Rolla	...	...	...	...
Saint Cloud	53	10	22.5	0.90	Round Springs	...	...	...	...
Saint Olof	47	12	18.4	1.28	Saint Charles	82	10	42.8	3.18
Sandy Lake Dam	48	25	18.4	2.03	Saint Joseph	81	11	42.2	4.67
Sheldon	48	17	19.4	0.90	Saint Louis	83	6	40.7	3.67
Wabasha	49	5	25.4	2.93	Sedalia	...	...	...	...
Willmar	48	17	19.4	0.90	Shelbina	67	8	36.1	2.34
Winona	54	3	28.1	2.19	Steffville	81	8	43.2	3.59
<i>Mississippi.</i>	...	...	...	...	Stellada	84	7	42.1	3.43
Aberdeen	83	21	53.2	2.56	Sublett	72	5	36.6	2.79
Agricultural College	80	18	52.0	2.00	Unionville	82	1	34.1	1.67
Batesville	80	27	55.1	1.77	Vancleave	...	...	...	...
Briers	83	23	57.5	3.12	Vermont	81	9	40.2	1.91
Brookhaven	81	20	54.4	5.21	Virgil City	80	8	41.4	3.58
Canton	86	19	54.0	1.68	Wellsville	80	10	39.2	4.34
Clarksdale	...	...	...	...	...	...	...	...	...
Columbus	88	19	54.6	3.00	...	...	...	...	...
Columbus	...	...	...	...	...	...	...	...	...
Corinth	83	25	56.1	4.23	...	...	...	...	...
Crystal Springs	83	25	56.1	4.23	...	...	...	...	...
Edwards	83	25	56.1	4.23	...	...	...	...	...
Enterprise	86	23	54.7	3.97	...	...	...	...	...
Fayette	82	25	57.9	2.47	...	...	...	...	...
Greenville	80	22	52.9	2.70	...	...	...	...	...
Hattiesburg	78	36	59.5	3.23	...	...	...	...	...
Kosciusko	85	20	53.6	4.51	...	...	...	...	...
Lake	83	22	53.8	4.51	...	...	...	...	...
Logtown	79	30	59.5	6.19	...	...	...	...	...
Louisville	84	18	53.8	3.72	...	...	...	...	...

## Meteorological record of voluntary observers, &amp;c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
Missouri—Cont'd.	o	o	o	Ins.	Nevada—Cont'd.	o	o	o	Ins.
Wheatland	82	9	40.2	3.94	Carson City	73	14	39.5	1.47
Whiteside	82	9	40.2	4.49	Cranes Ranch	.....	.....	.....	2.20
Montana.	.....	.....	.....	.....	Downeyville	85	11	43.0	0.97
Boulder†	69	—4	27.6	0.08	Elko*	70	4	33.5	1.72
Bozeman†	63	—3	27.1	0.60	Elko (near)*†	76	0	32.4	0.99
Camp Poplar River†	49	—22	13.4	0.10	Ely	65	—10	33.8	2.60
Cokedale*	66	.....	24.4	0.55	Empire Ranch.	64	1	26.6	1.48
Columbia Falls†	61	—10	30.6	0.95	Fenelon*	65	10	33.3	0.80
Corbin†	67	0	30.3	.....	Genoa	75	16	38.4	2.13
Deer Lodge City†	68	—4	31.4	0.16	Gulconda*†	62	20	35.1	0.50
Fort Custer	75	—6	29.9	0.35	Halleck*	70	—6	29.5	2.37
Fort Keogh	74	—14	21.5	0.25	Hawthorne*	74	28	44.3	0.16
Fort Logan†	65	—14	23.4	0.21	Hawthorne b	78	18	41.9	0.16
Fort Missoula	63	—12	28.1	0.17	Hot Springs*	67	23	40.0	0.10
Glendive†	68	—13	21.7	0.50	Lewers Ranch	70	12	38.5	3.05
Great Falls†	62	0	35.7	0.58	McDermitt	73	5	35.8	0.29
Hogan	65	0	26.2	0.03	Mill City*	59	24	35.3	.....
Horr†	66	3	31.0	0.36	Monitors Ranch	68	—6	33.6	2.46
Martinsdale†	67	—10	28.8	0.45	Palisade*	66	14	35.1	2.60
Mingusville†	71	5	30.6	.....	Palmetto	67	4	32.9	0.23
Powder River†	76	—13	25.7	1.04	Reno*	65	18	41.6	0.25
Virginia City†	60	4	28.4	0.34	Reno State Univ's.	73	13	40.2	0.58
Nebraska.	.....	.....	.....	.....	Saint Clair	81	18	41.6	1.88
Agee*†	84	2	30.9	1.86	South Camp†	60	8	31.4	1.80
Albion	74	—4	29.3	1.65	Stofel	68	—21	27.2	4.69
Anselby†	78	—18	31.7	1.80	Sunnyside	75	.....	.....	4.82
Arberville*	82	3	31.2	1.75	Tecoma*	70	12	32.3	0.92
Arcadia	.....	.....	.....	1.70	Toano*	45	10	28.4	.....
Ashland†	76	2	32.8	0.85	Tuscarora†	60	10	32.6	1.15
Ashton	81	—7	31.7	1.11	Tybo	70	5	35.9	4.15
Auburn b*	78	6	37.5	1.44	Verdi*	69	8	37.7	2.27
Basset†	78	—5	27.1	1.31	Virginia City	67	15	38.0	1.08
Beatrice†	80	.....	33.7	1.15	Wabaska*	80	36	45.4	T.
Beaver City†	89	—4	36.3	0.25	Wadsworth*	78	34	43.2	0.00
Belvidere*	82	6	34.0	1.35	Wells*	50	4	30.0	1.20
Burwell*	60	6	35.1	3.13	Winnemucca*	72	21	39.3	1.24
Callaway†	85	4	32.6	1.67	New Hampshire.	.....	.....	.....	.....
Cooleyton	.....	.....	.....	0.50	Antrim	.....	.....	.....	3.46
Cornlea	80	.....	.....	1.53	Belmont	.....	.....	.....	2.87
Creighton*†	74	—7	29.3	1.65	Berlin	53	—22	21.0	.....
David City*†	75	—2	27.0	4.20	Berlin Mills	52	—22	22.9	2.06
De Soto*	71	0	32.3	1.22	Bethlehem	47	—11	23.8	2.62
Dunning†	72	6	30.8	0.75	Brookline*	54	—2	30.9	2.87
Ericson*†	82	—5	30.0	1.70	Concorda	48	0	27.4	2.58
Ewing	.....	.....	.....	1.77	Dublin	53	1	25.7	1.05
Fairbury*	81	4	.....	1.64	Durham	55	11	31.2	2.22
Falls City†	.....	.....	.....	1.70	East Canterbury	49	3	27.3	2.77
Fort Robinson	79	—6	32.6	1.19	Grafton†	46	8	27.0	2.61
Fort Sidney	70	—8	27.2	0.28	Groveton*†	49	—13	23.1	.....
Franklin	86	0	35.0	0.53	Hanover*	45	—6	27.2	2.12
Fremont*	73	—1	31.8	1.73	Keene	50	—1	29.0	1.97
Geneva*	.....	.....	.....	1.40	Lakeport	.....	.....	.....	2.97
Genoa†	75	—2	29.7	1.73	Lancaster	55	—12	26.5	2.20
Gering†	79	0	33.2	0.32	Littleton	48	—13	24.3	2.92
Haigler†	82	9	34.7	0.60	Manchester†	52	0	30.8	2.84
Hartington†	71	—8	26.4	1.73	Newton	51	8	29.8	2.07
Harvard*	83	—2	32.9	1.39	North Conway	52	—10	24.9	2.84
Hay Springs†	78	—13	28.5	2.36	Peterboro	48	—7	27.0	2.37
Hebron†	87	—1	36.4	0.71	Plymouth†	46	—10	24.2	2.78
Holdrege*	.....	—8	29.6	0.55	Sanbornston	45	4	25.0	2.23
Imperial*	80	5	37.4	0.80	Stratford	52	—15	26.9	2.45
Indianola*	86	0	35.8	T.	Tilton†	48	0	28.4	.....
Kennedy*†	76	2	30.5	1.20	Walpole	49	—4	26.9	2.45
Lexington†	90	—9	36.8	1.58	Wiers Bridge	.....	.....	.....	2.90
Lincoln†	80	1	33.7	0.97	West Milan	55	—25	21.9	2.89
Madrid*	83	—4	31.6	0.95	Wolfboro	.....	.....	.....	1.79
Marquette*	77	0	.....	1.19	New Jersey.	.....	.....	.....	.....
Minden	82	6	33.0	1.98	Allaire	62	5	36.1	.....
Mullen*	71	—5	30.5	1.74	Asbury Park	55	10	36.0	4.16
Nebraska City*†	72	5	33.6	1.37	Barnegat	60	13	38.8	4.78
Nesbit†	84	—15	32.2	0.70	Bayonne	59	14	35.9	4.23
Norfolk†	71	3	28.4	2.35	Belvidere	55	12	33.9	3.58
North Loup†	75	—6	31.4	0.97	Beverly†	65	12	36.5	2.60
Oakdale†	77	6	28.5	1.66	Billingsport L.H.*†	60	14	36.8	3.08
O'Neill†	86	—6	28.1	1.80	Boonton	.....	.....	.....	3.52
Oughb†	.....	.....	.....	0.62	Bridgeton*	65	15	41.0	3.81
Paddock†	76	—4	28.7	2.23	Butler	.....	.....	.....	4.38
Palmer*	80	—10	27.7	1.50	Camden	61	14	37.7	2.73
Plattsmouth†	.....	.....	.....	1.35	Cape May	63	13	38.4	4.28
Ponca*	66	—6	27.6	1.20	Deckertown	51	7	31.84	3.72
Ravenna	87	—7	32.0	1.87	Dover	54	8	32.4	3.10
Red Cloud	.....	.....	.....	0.40	Egg Harbor City†	67	11	37.3	3.09
Santee Agency†	78	—4	30.2	1.66	Elizabeth†	56	11	34.9	4.22
Seward*	70	8	35.0	1.34	Franklinville	67	10	37.6	4.11
Springview	78	—4	28.4	2.22	Freehold†	65	11	37.4	3.68
Stanton†	.....	.....	.....	1.60	Friesburg	.....	.....	.....	3.34
State Farm†	81	1	33.2	1.57	Gillette	60	11	34.8	3.29
Superior*	80	8	37.2	0.02	Hanover	57	12	34.4	2.45
Syracuse*	75	5	35.1	0.96	Highland Park†	60	11	35.9	3.22
Table Rock*†	84	—2	36.7	1.62	Hightstown†	60	10	35.6	4.36
Tekamah	70	—3	30.8	1.72	Imlaystown.	66	11	36.9	6.03
Turlington*	82	4	36.3	1.10	Junction*	56	14	.....	3.70
Wallace*	82	0	31.9	1.50	Lambertville	58	12	36.0	3.47
Weeping Water*	79	—5	31.5	0.97	Locktown	57	11	35.0	2.36
West Point†	67	—5	27.9	1.25	Millville	68	15	41.0	3.47
Whitman*	78	0	27.9	2.00	Moorestown†	64	13	36.8	2.68
Wilcox†	.....	.....	.....	0.53	Mount Holly	67	14	39.4	6.01
Nevada.	.....	.....	.....	.....	Newark*	53	13	35.5	3.73
Austin	63	5	33.3	1.72	Newark b†	55	13	36.4	3.35
Battle Mountain*	75	20	41.6	0.73	New Brunswick a	63	10	37.2	3.22
Belmont	59	3	29.6	1.89	New Brunswick b.	60	12	34.4	3.04
Beowawe*	74	22	36.2	0.80	Newton	51	8	31.7	3.50
Browns*	80	25	44.1	0.25	Ocean City	65	12	37.4	4.28
Candelaria	70	14	36.8	1.19	Oceanic	61	13	36.8	3.91
Carlin*	67	8	32.0	3.25	Paterson	60	16	37.2	3.86



Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>New Jersey—Cont'd.</i>				<i>Ins.</i>	<i>New York—Cont'd.</i>				<i>Ins.</i>
Pensauken.....	61	11	36.0	2.41	Rondout f.....	52	17	33.0	4.60
Plainfield.....	63	12	36.0	3.53	Setauket f.....	51	15	34.0	5.74
Rancocas.....	63	12	36.0	2.95	South Canisteo f.....	55	5	29.9	3.51
Readington *.....	60	14	38.6	.....	South Kortright f.....	50	4	28.5	2.32
River Vale f.....	54	6	33.6	4.76	Turin.....	45	2	24.0	3.40
Salem.....	64	14	40.2	3.08	Utica.....	44	5	28.2	3.16
Somerville.....	64	6	36.4	3.30	Varysburg.....	61	7	30.1	2.21
South Orange f.....	55	13	34.4	3.42	Victor.....	63	8	31.5	2.00
Tenafly f.....	58	10	34.6	4.79	Wappingers Falls.....	52	6	31.9	4.78
Toms River.....	52	11	36.3	6.26	Watertown.....	57	5	28.8	1.81
Trenton.....	60	12	37.8	2.90	Watkins f.....	58	10	31.0	1.97
Vineland.....	68	11	39.2	2.94	Wedgwood f.....	56	4	29.7	2.93
Whiting.....	65	12	38.8	3.30	West Chazy.....	51	8	33.2	0.87
Woodbine.....	63	10	36.9	3.84	West Point f.....	51	8	33.2	3.94
<i>New Mexico.</i>					Willets Point.....	54	14	34.8	4.48
Albuquerque f.....	80	21	45.8	0.22	<i>North Carolina.</i>				
Chama f.....	73	2	32.3	5.15	Asheville f.....	79	9	44.2	2.99
Deming f.....	80	31	54.2	0.42	Bakersville f.....	78	12	44.9	1.62
East Las Vegas f.....	73	15	40.6	0.07	Bailey.....	77	12	44.9	1.13
Embudo.....	79	13	42.2	0.72	Blowing Rock f.....	67	6	41.6	2.73
Folsom f.....	77	9	39.4	0.00	Bryson City f.....	67	6	41.6	3.16
Fort Bayard.....	81	18	44.3	0.35	Chapel Hill f.....	77	22	48.0	1.48
Fort Wingate.....	75	11	37.9	1.11	Columbus.....	68	12	43.0	2.05
Gallinas Spring f.....	81	17	45.8	T.	Douglas.....	74	21	46.4	3.60
Halls Peak f.....	71	6	35.8	0.03	Experiment f Farm.....	78	21	48.8	1.29
Hillsboro f.....	84	21	49.0	0.20	Fayetteville f.....	70	5	40.6	2.08
Lordsburg f.....	76	38	50.4	1.00	Highlands f.....	70	5	40.6	4.04
Los Lunas f.....	81	16	41.4	T.	Horse Cove f.....	73	10	44.3	3.40
Monero f.....	67	0	31.8	1.25	Lenoir f.....	72	12	46.8	1.10
Olio f.....	70	15	41.2	0.43	Lewiston.....	77	12	46.8	4.98
Socorro f.....	57	23	40.7	0.00	Lillington f.....	78	21	44.4	0.98
Springer f.....	80	10	48.8	0.30	Littleton f.....	76	24	47.6	1.18
<i>New York.</i>					Lynn f.....	80	11	47.0	1.77
Adams Center.....	53	10	31.8	1.47	Marion.....	80	11	47.0	1.35
Addison f.....	53	10	31.8	2.62	Morgan f.....	78	20	49.4	1.16
Akron.....	70	11	30.0	2.27	Mount Airy f.....	75	20	45.1	1.43
Albion.....	53	3	26.9	3.34	Mount Holly f.....	77	19	49.2	1.46
Alfred Center f.....	57	3	24.0	0.70	Mount Pleasant f.....	77	19	49.2	3.50
Angela f.....	58	3	29.3	2.87	Murphy f.....	70	22	48.4	3.61
Arcade f.....	49	3	27.0	2.64	Newbern f.....	75	17	47.2	1.07
Arkwright.....	58	6	29.0	.....	Oak Ridge f.....	71	20	46.6	1.05
Atlanta.....	57	9	30.2	2.45	Pittsboro f.....	74	21	50.8	1.70
Avon.....	57	9	30.2	2.45	Raleigh f.....	73	20	47.6	0.97
Baldwinsville f.....	50	0	30.7	2.80	Rockingham f.....	71	21	49.5	1.55
Bedford.....	50	0	30.7	2.80	Roxboro f.....	76	18	46.6	0.80
Binghamton f.....	56	11	34.2	4.75	Saxton f.....	75	21	48.9	3.09
Brockport.....	66	11	31.2	2.16	Shelby.....	82	21	50.8	1.98
Brookfield f.....	48	2	28.4	2.08	Smithfield.....	77	19	49.7	1.43
Canton f.....	61	1	27.2	0.92	Soapstone M't f.....	80	17	49.6	1.70
Carthage f.....	53	4	25.9	1.87	Warrenton.....	79	23	47.1	3.00
Chenango Forks.....	50	0	30.2	2.45	Wilkeson f.....	79	21	47.1	3.00
Cherry Creek.....	47	4	25.2	1.87	<i>North Dakota.</i>				
Constableville f.....	47	4	25.2	1.87	Ashley f.....	47	29	16.0	2.78
Cooperstown f.....	52	5	28.5	2.13	Berlin f.....	50	25	17.0	1.30
Cortland.....	47	8	29.4	2.22	Bottineau f.....	43	35	9.4	.....
De Kalb Junction.....	47	8	29.4	2.22	Churchs Ferry f.....	40	22	10.4	0.87
Demeter.....	47	8	29.4	2.22	Dickinson f.....	54	15	16.5	0.60
Deposit.....	47	8	29.4	2.22	Ellendale f.....	57	9	19.5	1.25
Dunkirk.....	62	11	30.9	1.84	Fargo f.....	39	27	10.9	0.71
Easton.....	65	4	32.0	6.15	Fort Yates f.....	48	23	12.2	0.88
Eden Center.....	65	4	32.0	6.15	Gallatin f.....	48	23	12.2	0.88
Ellis.....	56	10	34.3	2.05	Grafton f.....	44	20	10.6	0.95
Elmira f.....	56	10	34.3	2.05	Grand Forks f.....	39	20	7.7	0.90
Factoryville f.....	55	8	32.4	2.89	Jamestown f.....	45	20	15.7	3.14
Fleming f.....	52	9	30.2	1.25	Kelso f.....	45	20	10.9	0.90
Fort Niagara.....	67	16	34.4	2.21	Lakota f.....	48	20	12.8	0.60
Friendship.....	62	5	29.2	2.33	Mayville f.....	49	14	13.8	1.00
Geneva f.....	53	10	31.9	1.50	Medora f.....	65	11	22.7	0.40
Glens Falls.....	48	3	28.4	1.90	Milton f.....	45	23	11.0	0.80
Gloversville f.....	46	3	26.9	1.84	Minto f.....	48	23	11.0	0.80
Honeybrook Brook f.....	50	9	30.6	3.08	Napoleon f.....	49	20	14.9	1.06
Humphrey f.....	58	5	30.4	2.63	Power f.....	42	24	14.4	0.57
Ithaca f.....	53	10	30.2	2.49	Reynolds.....	44	25	10.4	0.66
Jamestown f.....	60	9	32.4	.....	Saint John f.....	50	30	15.6	0.98
Kings Station.....	47	3	29.2	1.77	Sykeston f.....	49	20	16.1	0.98
Lebanon Springs.....	53	3	29.2	1.77	Wahpeton f.....	49	20	16.1	0.98
Le Roy.....	64	8	29.3	3.90	Wild Rice f.....	45	31	8.7	1.10
Lockport.....	64	11	32.0	2.62	Willow City f.....	48	31	9.7	0.25
Lowville.....	50	2	26.0	1.86	Woodbridge f.....	48	31	9.7	0.25
Lyndonville.....	50	2	26.0	1.86	Yule f.....	68	16	21.3	0.34
Lyons f.....	54	13	31.3	1.22	<i>Ohio.</i>				
Lyon Mountain.....	54	1	24.4	.....	Akron f.....	73	12	36.6	2.88
Madison Barracks.....	55	6	27.8	1.22	Annapolis.....	70	8	37.9	1.97
Malone.....	61	0	25.0	0.85	Ashland f.....	69	10	36.0	1.91
Middletown f.....	48	13	31.7	3.86	Athens f.....	80	12	40.2	1.75
Minnewaska f.....	44	8	27.9	3.80	Auburn.....	72	5	34.1	3.18
Mount Morris.....	65	9	31.4	.....	Bangorville f.....	73	5	36.1	2.30
Newark Valley.....	47	5	28.1	.....	Bellevue f.....	74	14	35.7	1.50
Newfield Summit.....	47	5	28.1	.....	Bement f.....	75	9	33.1	3.31
New Lisbon f.....	50	3	27.5	0.12	Benton Ridge.....	74	7	37.0	1.56
N'th Hammond f.....	56	7	27.9	0.98	Bethany.....	74	14	39.2	2.02
Number Four f.....	49	7	23.8	2.47	Big Prairie f.....	75	8	32.4	2.44
Ogdensburg f.....	55	2	27.4	.....	Bissells.....	72	4	34.4	2.64
Oxford.....	49	5	29.6	2.58	Bloomington f.....	76	12	38.8	1.88
Palermo f.....	48	2	28.6	1.32	Caledonia f.....	76	7	37.7	1.42
Perry City f.....	52	7	28.9	2.43	Cambridge.....	76	7	37.7	1.42
Phoenix.....	47	5	28.1	.....					
Plattsburg B'ks.....	46	2	24.8	0.68					
Port Jervis.....	50	10	31.7	3.80					
Potsdam f.....	58	0	26.2	0.75					
Poughkeepsie.....	53	4	31.8	3.02					
Quaker Street.....	45	5	26.3	1.80					
Romulus.....	54	10	30.8	1.90					

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>Ohio—Cont'd.</i>	°	°	°	<i>Ins.</i>	<i>Oregon.</i>	°	°	°	<i>Ins.</i>
Campbelltown *.	70	9	35.0	1.82	Albany a f.	64	28	44.0	2.71
Camp Dennison 1.	76	13	42.4	1.95	Albany b *.	62	32	46.6	2.77
Canton f 1.	74	10	35.4	2.20	Arlington f.	71	24	43.4	0.51
Cardington.	74	7	36.7	1.75	Ashland a *.	70	28	43.7	2.30
Carrollton.	78	4	37.9	1.94	Ashland b.	76	24	43.0	1.99
Cedarville.	73	12	41.0	2.63	Aurora *.	62	28	47.0	4.29
Celina f.	73	12	41.0	2.39	Bake Oven *.	65	22	37.8	1.20
Cherry Fork.	74	3	40.1	1.93	Bandon *.	62	32	46.7	10.84
Chicago.	73	12	41.0	1.24	Beulah f.	58	5	32.8	0.78
Circleville f.	76	13	39.2	1.98	Brownsville *.	70	30	46.2	2.22
Clarksville f.	76	13	39.2	1.91	Canyon City f.	73	15	39.9	1.80
Cleveland 1.	74	5	35.9	2.27	Comstock *.	75	30	45.9	3.99
Coalton.	82	8	42.0	1.60	Corvallis a.	63	26	44.3	4.55
Colebrook.	76	12	42.9	2.04	Corvallis b *.	62	27	44.1	3.12
Dayton 1.	76	12	42.9	1.98	Crook.	68	6	33.5	1.65
Demos.	76	11	38.5	1.19	East Portland *.	66	27	.....	5.55
Ellsworth.	74	12	37.0	0.82	Eugene.	73	29	45.8	2.57
Elyria.	74	12	37.0	2.21	Fife f.	65	2	31.9	0.40
Findlay 1.	73	10	35.6	1.56	Gardiner.	60	32	46.5	9.05
Fostoria 1.	72	10	38.4	1.82	Glenora.	58	24	39.7	14.10
Frankfort.	80	12	40.7	2.35	Grants Pass a f.	78	23	44.0	3.57
Garrettsville 1.	73	8	33.7	4.44	Grants Pass b *.	73	27	44.4	3.45
Georgetown 1.	80	9	42.4	2.79	Happy Valley f.	71	9	34.6	1.33
Granville 1.	78	10	38.4	2.87	Heppner f.	70	24	41.3	1.66
Gratiot.	77	9	38.8	2.07	Hood River (near).	63	24	39.2	4.23
Green Hill.	76	3	34.5	2.14	Jacksonville.	73	25	44.6	2.07
Greenville 1.	70	9	37.7	2.35	Joseph f.	59	2	28.0	2.00
Hackney.	77	9	39.6	2.16	Junction City *.	60	30	44.4	0.63
Hanging Rock 1.	82	10	41.9	1.88	Lafayette.	62	28	44.8	4.32
Harbor.	69	12	33.9	2.12	La Grande f.	63	22	36.6	2.95
Hillhouse.	73	7	34.5	2.21	Lakeview f.	61	1	31.6	1.74
Hillsboro.	79	11	41.2	2.08	Langlois.	70	32	48.5	15.85
Hiram 1.	73	3	33.7	4.53	Leland *.	78	28	41.4	4.42
Jacksonboro *.	75	9	38.9	1.30	Lone Rock.	70	15	35.2	0.82
Kenton f.	76	7	36.5	2.66	McMinnville b *.	60	28	45.2	3.47
Killbuck.	76	10	40.3	2.39	Monmouth *.	65	30	45.5	3.35
Leipsic.	76	10	40.3	2.02	Mount Angel f 1.	62	27	43.9	4.45
Levering.	75	12	42.5	2.38	Newberg.	63	29	44.6	4.00
Logan 1.	75	12	42.5	2.08	New Bridge.	72	17	40.6	.....
Lordstown 1.	70	6	34.3	3.21	Newport.	61	27	43.6	5.09
Lowell.	81	10	40.7	1.39	Portland *.	60	28	44.1	4.15
McArthur.	78	12	42.4	1.93	Riddles *.	78	30	45.1	2.41
McConnelsville 1.	79	10	38.5	1.99	Roseburg *.	78	32	48.2	1.53
McLune.	79	10	39.3	1.20	Salem a *.	58	28	45.6	1.83
Mansfield f.	76	10	40.3	2.76	Salem b f.	75	25	45.8	4.16
Marietta a f.	76	10	40.3	1.42	Sheridan *.	62	30	45.9	4.39
Marietta b 1.	80	17	43.1	1.39	Silver Lake f.	73	9	36.2	1.00
Marion 1.	74	11	36.9	1.02	Silverton *.	66	28	43.8	3.55
Millport.	75	4	36.6	2.21	Slakiyon *.	73	26	38.5	6.20
Montpelier 1.	67	8	34.3	1.57	Sparta.	55	12	32.4	2.40
Mountville.	73	10	38.4	1.31	Springfield *.	70	27	43.8	2.48
New Alexandria 1.	73	10	38.4	1.05	The Dalles f.	70	25	44.0	0.66
New Berlin.	73	10	38.4	1.86	Toledo.	63	27	45.3	9.80
New Comerstown 1.	77	12	38.0	2.26	Umatilla f.	60	.....	.....	0.65
New Holland.	78	10	38.4	2.40	Vale.	69	15	38.8	0.57
North Lewisburg 1.	75	8	38.9	2.20	Vernonia *.	60	24	39.8	6.92
North Royalton.	73	10	38.4	3.10	Wagner.	75	12	38.7	1.05
Oberlin 1.	73	8	36.2	1.87	West Fork *.	75	32	45.7	2.65
O. S. University f.	77	9	38.9	1.92	Williams.	74	20	43.9	2.95
Orangeville.	68	10	35.1	3.10	<i>Pennsylvania.</i>	62	16	42.9	1.06
Pataskala.	78	8	38.9	2.60	Altoona.	58	16	36.6	2.96
Piqua 1.	74	10	40.0	1.80	Aqueduct *.	55	12	31.8	4.16
Plattsburg.	74	8	37.3	2.45	Blooming Grove *.	52	14	34.6	2.99
Pomeroy.	78	14	40.7	2.00	Blue Knob *.	54	6	31.5	1.94
Portsmouth a f.	87	16	44.0	2.12	Brookville f.	61	28	43.8	2.44
Portsmouth b 1.	87	16	44.0	2.12	Browsers Lock.	61	12	35.8	1.44
Ridgeville Corners.	73	9	36.6	1.83	Carlisle.	59	13	38.3	1.53
Rittman.	73	9	36.6	2.04	Clarion f.	60	11	35.7	2.88
Sharon Center.	72	13	37.0	2.37	Coatesville 1.	60	11	35.7	2.88
Shenandoah.	72	13	37.0	2.27	Confience f.	60	.....	.....	1.36
Sidney f.	72	13	37.0	2.41	Coopersburg 1.	56	10	34.8	2.53
Springboro.	72	13	37.0	2.19	Corry.	69	6	32.8	3.30
Strongsville.	72	13	37.0	2.35	Davis Island Dam f.	60	.....	.....	0.98
Sylvania 1.	72	9	36.3	1.79	Doylestown.	55	4	32.3	3.44
Thurman.	83	10	42.8	1.65	Drifton t.	55	4	32.3	3.44
Timin f 1.	72	11	36.8	1.48	Du Bois f.	49	5	28.6	3.30
Tyrone *.	78	6	38.2	2.26	East Mauch Chunk.	56	12	34.3	4.24
Upper Sandusky 1.	71	12	38.2	1.94	Easton 1.	53	10	34.0	3.10
Van Wert.	71	4	35.6	1.91	Edinboro *.	66	10	30.5	.....
Walnut.	70	2	35.4	2.30	Emporium.	66	10	33.3	2.92
Warren.	70	2	35.4	3.68	Fks of Neshaminy.	66	10	30.9	2.16
Wauseon 1.	69	6	35.2	3.97	Frederick.	60	.....	.....	2.64
Waverly 1.	83	13	43.9	2.50	Freeport f.	60	.....	.....	1.47
Waynesville.	74	11	38.9	2.70	Gettysburg f.	60	.....	.....	2.24
Westerville 1.	74	11	38.9	1.93	Girardville 1.	52	8	32.9	4.82
West Milton *.	72	11	38.9	3.33	Grampian *.	60	8	32.0	2.49
Weymouth.	74	2	34.9	1.33	Greensboro f.	56	11	35.0	3.97
Wheeler f 2.	75	10	37.7	1.89	Hamburg.	63	8	36.3	1.86
Wooster a 1.	75	10	37.7	1.89	Hollidaysburg 1.	50	7	30.4	3.35
Wooster b f.	68	4	34.3	2.21	Honesdale 1.	62	12	36.3	2.07
Youngstown 1.	68	4	34.3	2.39	Huntingtown f.	60	11	37.8	1.45
Zanesville f.	76	12	42.9	1.66	Kane.	60	3	28.7	2.26
					Kennett Square *.	60	.....	.....	3.01
<i>Oklahoma Ter.</i>	90	10	52.5	1.85	Kilmer *.	60	16	35.7	1.67
Burnett f.	84	13	50.4	1.18	Lancaster.	60	12	36.0	2.24
Port Reno f.	77	9	48.8	1.90	Lansdale.	57	11	35.5	1.80
Port Sill.	77	12	49.8	1.36	Lebanon.	57	11	35.5	2.03
Gate City f.	94	10	48.9	0.03	Le Roy f.	50	5	30.2	3.10
Guthrie f.	85	12	53.7	2.14	Lewisburg *.	57	12	34.0	3.07
Keokuk Falls f.	83	12	48.1	1.80	Ligonier.	74	10	36.3	1.73
Mangum f.	93	13	52.0	0.55	Lock Haven f 1.	61	10	34.1	2.26
Sac & Fox Agency f.	84	12	47.6	1.75					
Stillwater f 1.	85	11	49.3	1.43					
Winnview f.	85	8	51.0	1.10					

## Meteorological record of voluntary observers, &amp;c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>Pennsylvania—Con.</i>					<i>S. Dakota—Cont'd.</i>				
Lock No. 4 f.				1.06	Webster f.	46	-23	21.4	5.49
Lycippus				1.43	Wessington Sp'gs f.	71	-13	25.7	3.01
McConnellsburg f.	65	12	38.5	1.77	Wolsey f.	59	-17	22.8	2.52
Mahoning f.				2.30	<i>Tennessee.</i>				
Meadville	69	7	32.2	3.35	Andersonville f.	79	18	43.0	1.30
Newcastle f.	72	10	37.9	2.11	Ashwood f.	75	14	48.9	3.18
Oil City f.				2.92	Austin f.	78	10	46.6	2.89
Ottsville				2.67	Bethel Springs f.	78	23	53.8	1.88
Parker f.				3.18	Bolivar f.		18	49.9	1.34
Philadelphia f.				2.02	Byrdstown f.				2.53
Philadelphia f.	61	14	39.4	2.67	Carthage f.				2.05
Phoenixville	59	13	37.7	2.68	Charleston f.				2.43
Point Pleasant				1.84	Clarksburg f.	79	10	48.2	2.14
Pottstown	57	14	37.4	2.82	Clinton f.				2.95
Quakertown f.	56	10	34.1	3.11	Columbia f.				2.64
Reading f.				3.51	Covington f.	76	14	49.7	2.37
Ridgway f.				2.73	Dunlap				3.63
Saegertown	63	7	32.1	2.94	Fayetteville f.	76	14	49.7	1.16
Salem Corners f.	54	9	29.0	4.32	Florence Station f.	75	14	48.0	2.61
Saltsburg f.				0.71	Franklin f.	82	14	50.8	2.58
Seisholtzville				3.16	Greenville f.	74	17	45.9	2.79
Selins Grove f.	60	12	35.5	3.57	Harriman f.	83	15	47.4	3.01
Skippack f.	59	20	37.0		Harrogate f.	70	15	47.2	2.48
Smithport	59	6	30.7		Jacksboro f.		16	44.5	2.34
Smiths Corners				2.24	Jackson f.	76	13	49.4	0.75
Somers f.	70	8	35.4	1.67	Johnsonville f.				3.08
South Easton	50	10	32.5	3.03	Kings f.				3.49
State College f.	56	10	33.2	1.88	Lookout Mount f.	73	8	45.2	2.15
Stoytown f.				1.49	Loudon f.				3.11
Uniontown f.	72	14	40.0	0.98	Lynnville f.	73	14	46.1	2.78
Warren f.				3.01	McKenzie f.	70	13	50.9	0.75
Wellsville f.	52	5	29.1	5.09	Missionary Ridge f.		10	48.6	
West Chester	59	11	37.1	2.40	Newport	80	19	45.0	2.70
West Newton f.				0.99	Nunnally f.	77	17	51.8	2.38
Westtown	61	15	35.8		Palmetto f.				2.96
Wilkesbarre f.	56	10	35.0	3.83	Ridgely f.	79	14	47.0	4.55
Wyom f.	54	10	32.7	2.91	Rockwood				3.73
York	62	9	37.1	1.75	Rogersville f.	76	19	45.2	2.87
<i>Rhode Island.</i>					Rugby	75	10	43.6	2.15
Bristol f.	50	14	33.4	3.17	Savannah f.	75	17	50.2	2.89
Kings f.	54	8	31.4	6.37	Springdale f.	76	19	47.4	2.41
Lonsdale				5.10	Strawberry Plains f.				2.62
Newport	56	14	35.8		Tazewell f.				2.40
Pawtucket f.	54	9	34.2	5.14	Waynesboro f.	73	16	44.9	2.49
Providence f.	54	14	34.7	5.59	<i>Texas.</i>				
Providence f.	54	10	32.8	5.01	Albany f.	84	26	55.0	1.04
Providence f.	54	10	32.4	5.77	Alice f.	92	37	66.8	1.04
<i>South Carolina.</i>					Arlington f.	88	19	58.2	3.92
Anderson f.				2.30	Arthur City f.				2.46
Candlen f.				1.18	Aurora f.				2.05
Cheraw f.	83	19	52.5	1.97	Austin f.	88	32	55.3	2.90
Cheraw f.				2.30	Austin f.	85	32	59.6	2.90
Conway	85	23	56.0		Boerne f.	87	26	61.3	2.10
Effingham f.				2.60	Brady f.	87	23	54.3	0.65
Evergreen	79	20	53.3	2.63	Brasoria f.	86	39	61.7	1.62
Greenville f.				2.01	Brenham f.	87	39	63.2	2.06
Kitching Mills f.				1.55	Brownwood f.	89	26	57.8	0.85
Longshore f.	80	19	52.5	1.32	Burnet f.	78	26	52.0	1.35
Mount Carmel f.				1.71	Camp Eagle Pass f.	98	34	62.6	0.00
Nichols f.				2.84	College Station	90	34	61.0	2.14
Port Royal f.	74	28	56.6	3.78	Colorado f.				0.14
Saint Stephens f.				3.28	Columbia f.	87	37	63.0	0.75
Society Hill	81	23	53.5	1.59	Corsicana f.	85	33	58.6	3.94
Statesburg f.	82	23	53.3	1.43	Corsicana f.	82	21	54.3	3.59
Tillers Ferry f.				3.71	Cuero f.	88	34	63.1	0.64
Waterloo f.	81	24	55.5	3.71	Dallas f.	83	20	55.3	2.88
Winnboro f.	82	21	51.5	1.02	Devine f.	85	33	61.0	1.57
Yorkville	79	18	51.8	1.68	Durham f.				0.99
<i>South Dakota.</i>					Duval f.	82	30	60.2	3.90
Aberdeen f.	49	-20	19.4	2.90	Eagle Pass f.				0.24
Alexandria f.	60	-15	24.5	4.20	Eastland f.	74	14	53.9	0.60
Ashcroft f.	72	-20	23.0	1.20	Fay				1.10
Bowdle f.	48	-10	20.0	3.00	Flower Bluff f.	80	41	67.2	0.08
Britton f.	47	-21	16.6	1.06	Forestburg f.	84	15	53.8	1.83
Carthage				0.90	Fort Brown f.	90	42	69.8	0.16
Castlewood f.	54	-19	19.5	1.93	Fort Clark	93	35	64.6	0.60
Clark f.				1.71	Fort Hancock	93	17	50.6	0.25
Cross f.	74	-15	26.9	0.88	Fort McIntosh	94	38	67.9	0.00
De Smet f.	60	-19	24.0	2.20	Fort Ringgold	98	37	68.7	0.00
Faulkton f.	52	-25	18.6	5.89	Fredericksburg f.	83	28	58.6	1.45
Flandreau f.	65	-14	26.0	0.73	Gainesville f.	83	16	54.4	1.63
Forestburg f.	62	-15	29.1	2.00	Graham f.	92	17	55.7	1.33
Fort Meade	73	-5	28.8	2.41	Grape Vine f.	85	18	56.6	2.55
Fort Sully	60	-11	26.6	2.80	Hallettsville f.	86	29	59.4	0.54
Frankfort f.	55	-23	21.7	3.05	Hartley f.	86	12	44.3	0.00
Gale f.	50	-18	22.8	2.80	Haskell f.	90	20	54.3	1.09
Gary f.	47	-16	19.4	1.70	Hidalgo f.				1.05
Hotch City f.	71	-15	28.0	1.52	Highland	92	30	57.2	1.05
Howard f.	64	-10	24.7	1.33	Houston f.	86	36	61.4	3.32
Kimball f.	68	-10	25.0	1.71	Huntsville f.	80	35	56.0	1.20
Mellette f.	60	-17	25.1	2.22	Kent				0.86
Midland f.	73	-10	28.4	1.05	Laredo f.				0.00
Millbank f.	73	-10	23.5	3.16	Llano f.	86	30	61.7	1.00
Oelrichs f.	81	-14	31.0	2.40	Luling f.	85	33	60.5	2.00
Onida f.	68	-21	23.6	0.80	McGregor f.	75	22	44.8	3.98
Parker f.	67	-12	24.8	2.80	Menardville f.	86	24	56.8	0.52
Parkston f.	69	-13	25.4	2.60	Mesquite f.	86	20	55.3	1.73
Piedmont				0.71	Mountain Spring f.	87	17	55.8	2.83
Plankinton f.	69	-11	25.2	1.77	New Braunfels f.	84	32	60.6	2.27
Salem f.	68	-16	20.7	1.32	Ochiltree f.				0.60
Sioux Falls f.	65	-12	25.3	2.77	Panther f.	90	21	57.8	1.60
Spearsburg f.	80	-7	28.3	1.45	Paria f.	82	18	51.6	3.14
Vermillion f.	70	-6	26.7	2.40	Quanah f.	95	14	52.0	1.75
Watertown f.	51	-19	20.2	1.58	Rio Grande City f.				0.00

## Meteorological record of voluntary observers, &amp;c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>Texas—Cont'd.</i>					<i>Washington—Con.</i>				
Roby†	85	17	52.2	1.13	Olga†	55	30	42.2	1.54
Rockport*†	80	40	62.6		Pine Hill*†	55	24	40.6	2.27
Round Rock†	86	30	61.3	3.07	Pullman*†	61	21	36.8	1.75
San Antonio	86	33	62.0	1.74	Rosalia†	61	7	34.4	1.73
Sierra Blanca†	79	24	53.7	0.50	Seattle†	59	32	45.8	4.27
Silver Falls†	93	17	53.9	0.93	Silver Creek*†	59	30	42.8	4.97
Sulphur Springs†	82	19	55.9	4.09	Tacoma†	61	27	43.8	4.27
Temple†	87	23	57.0	2.53	Vashon†			45.7	3.87
Twohig†	99	37	69.4	0.00	Waterville†	50	4	27.6	1.53
Victoria*†	83	38	64.7	0.25	<i>West Virginia.</i>				
Waco†	86	24	59.4	3.85	Bluefield†	72	4	41.0	2.83
<i>Utah.</i>					Buckhannon†				1.61
Beaver†	74	15	36.8	1.45	Buckhannon†	78	11	40.3	
Blue Creek*†	70	15	35.8	2.80	Central Station*†	76	10	44.2	1.48
Castle Gate†	70	4	34.2	2.75	Charleston†				1.72
Cisco†	80	12	42.8	0.76	Davis	66	3	34.0	2.79
Corinne*†	66	22	38.6	3.38	Elkhorn†	74	16	44.0	2.15
Deseret†	77	17	40.2	1.85	Ella†	74	11	38.8	1.37
Fillmore†	80	13	41.4	2.89	Fairmont†				1.05
Fort Du Chesne.				3.10	Glenville†	76	18	40.0	1.44
Green River†	79	17	43.0	0.94	Grafton†	76	15	41.0	1.13
Grouse Creek*†	61	5	28.6	2.02	Harpers Ferry†				0.62
Kelton*†	64	10	39.6	0.75	Hinton†				1.64
Lake Park	70	19	38.6	3.03	Kingwood*†	74	12	36.1	1.00
Levan†				3.42	Marlinton†	71	12	39.4	1.72
Loa†	72	3	33.3	0.52	Martinsburg†	69	16	40.4	1.32
Losee†	72	4	33.6	2.65	Morgantown†				1.04
Moab†	85	16	42.8	0.53	Morgantown†	74	12	41.6	1.02
Mount Carmel*†	74	10	37.0	4.07	New Cumberland	69	12	39.6	1.21
Ogden*†	75	22	39.1	3.10	New Martinsville*†	71	14	41.0	0.89
Parowan†	75	13	37.6	1.23	Nuttallburg	81	10	45.4	2.60
Promontory*†	53	10	33.2	2.10	Parkersburg†	75	14	42.0	0.94
Provo City†				1.35	Philippi†				1.08
Randolph†	50	-18	20.0	1.00	Pleasant Hill*†	66	8	33.4	
Richfield†	73	10	36.6		Point Pleasant*†	84	15	44.7	1.69
Saint George†	87	29	50.2	1.66	Rowlesburg†				1.00
Scofield†	60	-19	22.8	2.80	Spencer†	66	10	39.6	1.23
Snowville†	62	0	29.8	2.49	Tannery*†	68	9	39.9	
Stockton†				3.48	Weston*†	72	15	45.3	1.30
Terrace†	84	24	35.2	0.55	Wheeling†				1.12
<i>Vermont.</i>					Wheeling†	77	18	44.0	1.44
Brattleboro†	52	1	29.9	2.26	White Sul. Springs†				2.20
Burlington†	47	-5	28.3	0.52	<i>Wisconsin.</i>				
Chelsea*†	45	-5	21.7	1.03	Amherst	50	-9	23.8	1.95
Cornwall				1.12	Appleton†	56	-1	27.6	1.38
Enosburg Falls†	53	-3	26.4	1.20	Ashland†	50	-15	20.7	3.11
Hartland†	52	-8	25.4	1.94	Baraboo†	60	2	28.6	3.21
Hyde Park†	50	-8	25.4	0.96	Barron†	49	-23	19.7	1.75
Jacksonville	50	-8	26.4	3.03	Bayfield	50	-11	21.0	2.51
Norwich*†	51	-9	25.1	1.56	Beaver Dam	54	2	28.5	2.00
Simonsville	45	-3	23.6		Beloit†	63	6	31.7	2.81
South Royalton*†	48	-8	26.0	1.70	Black River Falls†	54	-13	24.1	1.57
Stratford†	43	-3	25.2	1.90	Butternut†	49	-30	16.7	1.37
Vernon*†	48	-4	26.6	2.94	Cadiz*†	4	-4	27.2	1.44
Wells	46	-4	24.9	1.96	Centralia	56	-6	24.8	1.13
Woodstock	49	-12	25.6	1.73	Chippewa Falls†				1.90
<i>Virginia.</i>					Columbus	60	2	28.1	2.40
Abingdon†				2.52	Crandon†	49			
Ashland†	80	18	44.6	1.24	Delavan (near)†	62	6	31.0	2.31
Avon†	71	20	44.9	1.84	Dexter†	51	-6	24.6	2.34
Bedford City†	73	30	44.4	1.10	Eau Claire	50	10	23.2	
Big Stone Gap†	80	14	40.4	2.90	Florence†	51	-16	22.2	3.24
Birdsnest*†	75	23	43.3	3.20	Fond du Lac†	51	-1	28.0	1.80
Blacksburg	70	16	42.5	0.86	Greensburg†	50	-20	21.8	0.90
Charlottesville	75	20	45.4	1.57	Harvey†	57	3	28.9	3.26
Christiansburg†				1.93	Hayward†	55	-26	20.0	0.37
Dale Enterprise†	70	11	41.8	1.39	Hillsboro	39	-7	26.2	2.99
Danville†				2.12	Janesville	62	5	30.6	3.80
Emporia†	79 <sup>b</sup>	22 <sup>b</sup>	51.6 <sup>b</sup>	1.65	Juneau†	58	-1	28.8	2.41
Falls Church†				2.18	Koepenick*†	64	-12	26.6	1.50
Hampton	70 <sup>b</sup>	25 <sup>b</sup>	45.2 <sup>b</sup>	2.44	Lafayette†	58	-2	27.6	1.99
Hot Springs	71	9	40.6	1.49	Lincoln†				24.7
Irwin†	73	21	45.1	1.17	Madison†	59	4	28.7	2.28
Lexington†	76	16	43.1	1.46	Manitowish†	36	1	27.9	2.68
Marion†	71	11	43.0	2.92	Meadow Valley†	53	-5	25.4	1.14
Nottaway	76	16	44.3	3.19	Medford†				2.25
Petersburg†	78	20	47.3	2.17	Medford†	51	-16	21.7	1.65
Richmond†	79	15	46.8	3.46	Menomoni	52	-15	21.2	2.81
Richmond†				2.04	Mineral Point	60	0	30.6	1.16
Riverton†				1.49	Neillville†	52	-13	23.7	2.65
Salem†	73	20	45.8	1.54	Oconowoc†	51	0	23.2	3.53
Saluda†	80	13	44.4	2.73	Oconomowoc†	61	2	30.4	1.77
Spottsville†	78	20	44.4	3.95	Oconto	52	-6	26.3	2.11
Stanardsville†	79	19	43.6	0.87	Oshkosh†	50	-27	19.9	2.91
Staunton†	74	14	41.3	1.84	Pepin	52	1	26.8	1.95
Stephens City†	72	17	42.1	1.06	Portage†	49	-18	20.6	2.26
Warsaw†	77	10	44.8	2.15	Prairie du Chien	65	-5	30.1	1.97
Woodstock†				1.27	Raymond	64	5	29.8	2.82
Wytheville†	71	9	41.6	0.81	Reedsburg†	60	-2	27.6	1.45
<i>Washington.</i>					Sharon†	63	5	30.7	2.39
Aberdeen†	64	32	42.4	10.82	Shawano	55	-10	25.0	2.52
Chehalis†	63	22	42.8	3.30	Shell Lake	49	-15	22.2	1.84
Chelan†	53	13	34.4	1.69	Sparta†	58	-8	26.6	3.40
Clyde†	73	29	44.4	1.69	Stevens Point†	50	-6	25.7	1.70
Colfax†	66	13	38.2	2.27	Valley Junction†	51	-6	24.8	2.04
Davenport†	56	7	32.6	1.26	Viroqua	58	-6	25.8	3.09
East Sound†	57	30	44.0	1.93	Watertown†	60	1	27.6	2.55
Elbe†				4.45	Waukesha†				2.98
Ellensburg†	59	16	36.2	0.84	Westfield†	56	-4	25.9	2.21
Ferry†	66	25	44.4	4.80	Weston*†	56	-8	21.1	2.21
Fort Simcoe	71	18	38.6	1.15	<i>Wyoming.</i>				
Fort Spokane	53	5	32.6	3.03	Big Horn Ranch†	65	-9	23.9	0.58
Fort Townsend†	58	27	43.0	2.26	Camp Pilot Butte.	68	-3	27.2	1.15
Madrone*†	60	28	43.1	4.53	Evanson	60	-10	27.7	0.67
Moxee Valley†	71	13	39.6	0.95					



## Meteorological record of voluntary observers—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
Wyoming—Cont'd.	°	°	°	Ins.	Canada.	°	°	°	Ins.
Fort McKinney.....	77	-4	29.9	0.23	Fort Francis, Ont..	50	-25	13.9	1.84
Fort Washakie.....	70	-5	30.1	0.26	Mexico.				
Fort Yellowstone.....	54	-4	24.0	0.96	Leon de Aldamas <sup>1</sup> .	84	44	64.6	0.03
Lander <sup>1</sup> .....	65	1	31.5	0.84	Topolobampo <sup>2</sup> .....	85	46	61.8	T.
Laramie <sup>1</sup> .....	64	0	28.8	0.29	New Brunswick.				
Lusk <sup>1</sup> .....	73	-7	29.5	0.48	Saint John.....	50	6	27.5	1.39
Saratoga <sup>1</sup> .....	63	-5	25.8	0.85	West Indies.				
Sheridan <sup>1</sup> .....	60	-13	27.6	0.33	Hamilton, Ber <sup>1</sup> ....	70	52	62.3	7.06
Sundance.....	60	-16	21.5	0.90					
Wheatland <sup>1</sup> .....	75	5	36.7	0.50					

## Reports received too late to be used in general discussion of weather for March, 1893.

Alabama.					Missouri.				
Lock No. 4.....	26		2.34		Arlington <sup>1</sup> .....			2.96	
Uniontown.....	82	24	55.6	4.48	Boonville <sup>1</sup> .....			2.85	
Wetumpka <sup>1</sup> .....	26		2.39		Cape Girardeau <sup>1</sup> .....			2.00	
Arizona.					Hermann <sup>1</sup> .....			3.58	
Antelope Valley <sup>1</sup> .....			4.39		Louisiana Bridge <sup>1</sup> .....			2.45	
California.					Nebraska.				
Julian <sup>1</sup> .....	74	24	42.8	14.42	Crete <sup>1</sup> .....	81	2	34.0	1.98
Oakland <sup>1</sup> .....	74	37	50.9	5.76	Harrison <sup>1</sup> .....	60	-8	28.9	0.50
Point Lobos.....	73	40	50.0	3.74	Nevada.				
Sanger.....			8.15		Pioche.....	76	6	38.6	3.34
Saticoy <sup>1</sup> .....			6.64		New Mexico.				
Upper Mattole <sup>1</sup> .....	85	34	49.4	18.05	Albert <sup>1</sup> .....	84	19	47.8	0.15
Florida.					Estalina Springs <sup>1</sup> .....	73 <sup>f</sup>	15 <sup>f</sup>	38.2 <sup>f</sup>	0.32
Federal Point <sup>1</sup> .....	86	30	61.0	8.40	Las Cruces <sup>1</sup> .....	87	21	50.6	0.02
Illinois.					Taos <sup>1</sup> .....	75	7	37.1	1.10
Alton <sup>1</sup> .....			5.86		Oregon.				
Beardstown <sup>1</sup> .....			3.69		Burns <sup>1</sup> .....	60	5	29.6	0.60
Louisville <sup>1</sup> .....	78	14	40.7	4.20	Cascade Locks.....	63	26	42.7	10.03
Peoria <sup>1</sup> .....			3.48		Cornelius.....			3.67	
Quincy <sup>1</sup> .....			2.14		Corvallis (near).....	64	26	45.0	4.75
Warsaw <sup>1</sup> .....			2.25		McMinnville <sup>1</sup> .....	64	26	44.0	5.67
Indiana.					Pennsylvania.				
Crawfordsville <sup>1</sup> .....	75	12	40.2	1.61	Indiana <sup>1</sup> .....	74	7	36.7	.....
Vincennes <sup>1</sup> .....			4.05		Swarthmore.....	75	13	39.1	3.31
Iowa.					South Dakota.				
Maquoketa <sup>1</sup> .....			31.8	3.17	Brookings <sup>1</sup> .....	63	-10	27.4	2.34
Muscatine <sup>1</sup> .....	73	5	34.7	3.49	Tennessee.				
Kansas.					Hohenwald <sup>1</sup> .....	80	10	48.4	3.03
Leoti <sup>1</sup> .....	87	-3	38.8	0.05	Parksville <sup>1</sup> .....	80	18	49.6	1.65
Mankato <sup>1</sup> .....	87	2	36.6	0.82	Texas.				
Medicine Lodge.....			0.00		Childress <sup>1</sup> .....	88	16	50.3	1.60
Pauline.....	82	9	42.2	1.10	Utah.				
Plainville.....			T.		Heber <sup>1</sup> .....	64	0	31.6	3.35
Kentucky.					Logan <sup>1</sup> .....	53 <sup>a</sup>	1	26.5 <sup>a</sup>	2.64
Williamsburg <sup>1</sup> .....			2.06		Manti <sup>1</sup> .....	70	14	36.7	5.25
Maine.					Singletree <sup>1</sup> .....	64	3 <sup>d</sup>	29.5 <sup>d</sup>	1.95
Kennebec Arsenal <sup>1</sup> .....	50 <sup>i</sup>	1	26.0 <sup>i</sup>	2.04	Virginia.				
Massachusetts.					Buchanan <sup>1</sup> .....			1.12	
Turners Falls.....	48	4	30.9	3.85	Cape Charles <sup>1</sup> .....	71 <sup>a</sup>	20	43.8	1.91
Minnesota.					West Indies.				
Bonniwells Mills <sup>1</sup> .....			1.60		Grand Turk Island.....			0.00	

## Received too late for publication in February, 1893.

Alabama.					Iowa.				
Eufaula <sup>1</sup> .....	79	31	52.2	.....	Muscatine <sup>1</sup> .....	42	-14	19.5	1.60
California.					Kansas.				
Lick Observatory <sup>1</sup> .....	74	22	37.7	3.40	Medicine Lodge.....			1.40	
Maxwell.....			3.25		Massachusetts.				
Sanger.....			3.74		Turners Falls.....	48	-6	24.0	4.54
Colorado.					Missouri.				
Surface Creek <sup>1</sup> .....	48	1	27.4	2.50	New Boston.....	50	-17	19.4	1.89
Idaho.					New York.				
Hailey <sup>1</sup> .....	-14		2.89		Minnewaska <sup>1</sup> .....	46	-10	19.7	8.15
Indiana.					South Dakota.				
Huntington <sup>1</sup> .....			1.83		Clark <sup>1</sup> .....	40		10.6	.....
Indian Territory.					Texas.				
Eufaula <sup>1</sup> .....			2.17		Fay.....			T.	

## Received too late for publication in January, 1893.

Ohio.					Ohio—Cont'd.				
Akron <sup>1</sup> .....	49	-8	18.7	3.02	Findlay <sup>1</sup> .....	48	-14	15.9	2.13
Athens <sup>1</sup> .....	55	-22	19.5	2.85	Fostoria <sup>1</sup> .....	46	-14	17.3	3.50
Bangorville <sup>1</sup> .....	46	-14	16.7	3.59	Georgetown <sup>1</sup> .....	59	-14	20.0	3.64
Canton <sup>1</sup> .....	49	-8	18.5	.....	Granville <sup>1</sup> .....	52	-17	16.8	.....
Celina <sup>1</sup> .....	51	-12	17.6	2.03	Greenville <sup>1</sup> .....	46	-17	17.6	3.86
Clarksburg <sup>1</sup> .....	56	-16	19.0	2.83	Hanging Rock <sup>1</sup> .....	57	-20	21.7	2.21
Dayton <sup>1</sup> .....	54	-13	21.5	2.77	Harbor <sup>1</sup> .....	49	-8	18.1	2.21

## Reports received too late, &amp;c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
Ohio—Continued.	°	°	°	Ins.	Ohio—Continued.	°	°	°	Ins.
Hiram <sup>1</sup> .....	49	-11	15.7	3.09	Piqua <sup>1</sup> .....	46	-18	14.0	1.93
Logan <sup>1</sup> .....	58	-18	19.9	3.49	Pomeroy <sup>1</sup> .....	51	-16	19.8	2.19
McArthur.....			19.1	.....	Portsmouth <sup>1</sup> .....	63	-11	23.0	2.31
McConnellsville <sup>1</sup> .....	55	-17	19.3	2.31	Ridge.....			3.07	
Marietta <sup>1</sup> .....	60	-8	23.0	2.80	Upper Sandusky <sup>1</sup> .....	46	-15	17.9	2.82
Marion <sup>1</sup> .....	52	-17	17.1	2.79	Vanceburg.....			2.86	
Montpelier <sup>1</sup> .....	47	-15	13.5	2.14	Waverly <sup>1</sup> .....	58	-17	20.7	2.26
New Alexandria <sup>1</sup> .....	50	-9	19.7	3.08	Waynesville.....			2.64	
New Comerstown <sup>1</sup> .....	51	-18	18.1	2.52	Wooster <sup>1</sup> .....	51	-9	17.9	4.01
Oberlin <sup>1</sup> .....	55	-12	18.4	4.30	Youngstown <sup>1</sup> .....	48	-12	17.5	2.27
O. S. University <sup>1</sup> .....	53	-17	18.3	2.13					

\*Extremes of temperature from observed readings of dry thermometer.

†Weather Bureau instruments.

A numeral following the name of a station indicates the hours of observation from which the mean temperature was obtained, thus:

1 Mean of 7 a. m. + 2 p. m. + 9 p. m. + 9 p. m. + 4.

2 Mean of 8 a. m. + 8 p. m. + 2.

3 Mean of 7 a. m. + 7 p. m. + 2.

4 Mean of 6 a. m. + 6 p. m. + 2.

5 Mean of 7 a. m. + 2 p. m. + 2.

6 Mean from readings at various hours reduced to true daily mean by special tables.

7 Mean from hourly readings of thermograph.

8 Mean of 7 a. m. + 2 p. m. + 9 p. m. + 3.

The absence of a numeral indicates that the mean temperature has been obtained from daily readings of the maximum and minimum thermometers.

An italic letter following the name of a station, as "Livingston a," "Livingston b," indicates that two or more observers, as the case may be, are reporting from the same station. A small Roman letter following the name of a station, or in figure columns, indicates the number of days missing from the record; for instance, "a" denotes 14 days missing.

No note is made of breaks in the continuity of temperature records when the same do not exceed two days. All known breaks, of whatever duration, in the precipitation record receive appropriate notice.

Corrections: Massachusetts, Hyannis, February, 1893, make precipitation 5.82 instead of 5.32. Michigan, Jedd, February, 1893, make precipitation 3.29 instead of 1.84. Alabama, Oxanna, January, 1892, make precipitation 10.11 instead of 1.01.

NOTE.—The following changes have been made in names of stations: North Dakota, Grand Rapids, changed to Berlin.

## Data from Canadian stations for the month of March, 1893.

Station.	Pressure.			Temperature.		Precipitation.		Prevailing direction of wind.
	Mean not reduced.	Mean reduced.	Departure from normal.	Mean.	Departure from normal.	Total.	Departure from normal.	
	Inches.	Inches.	Inches.	°	°	Inches.	Inches.	
Saint John's, N. F. ....	29.76	29.91	.....	20.5	-2.8	6.15	.....	W.
Halifax, N. S. ....	29.86	30.00	+ .12	27.2	-1.3	2.30	-3.56	W.
Grand Manan, N. B. ....	29.92	29.97	.....	29.2	.....	1.49	-2.66	W.
Yarmouth, N. S. ....	29.90	29.98	+ .10	30.0	-1.0	1.96	-2.90	N.
Saint Andrews, N. B. ....	29.90	29.95	.....	27.4	.....	1.34	-3.05	N.W.
Charlottetown, P. E. I. ....	29.91	29.95	.....	24.3	.....	2.36	-1.05	N.W.
Chatham, N. B. ....	29.92	29.94	+ .06	20.5	-0.5	1.66	-2.58	W.
Father Point, Que. ....	29.91	29.94	+ .06	19.8	+0.3	2.94	+0.48	W.
Quebec, Que. ....	29.99	29.99	+ .05	20.7	+0.7	2.05	-1.86	W.
Montreal, Que. ....	29.80	30.02	+ .07	24.0	+2.0	1.97	-1.72	SW.
Rockliffe, Ont. ....	29.46	30.00	+ .02	18.1	+2.1	1.46	-0.83	N.W.
Kingston, Ont. ....	29.70	30.03	+ .07	25.8	+1.8	1.31	-1.75	W.
Toronto, Ont. ....	29.64	30.04	+ .04	28.2	+2.7	2.02	-0.58	W.
White River, Ont. ....	28.64	30.09	.....	10.4	.....	0.21	.....	E.
Port Stanley, Ont. ....	29.38	30.05	.....	28.4	.....	2.13	-0.82	E.
Saugeen, Ont. ....	29.29	30.04	+ .03	25.2	+2.2	2.63	+0.08	W.
Parry Sound, Ont. ....	29.28	30.02	+ .02	21.2	+2.7	3.06	+0.44	SW.
Port Arthur, Ont. ....	29.28	30.02	- .06	16.3	+2.3	0.92	-0.25	W.
Winnipeg, Man. ....	29.21	30.11	- .01	7.4	-5.1	0.22	-0.80	SW.
Minneapolis, Man. ....	28.14	30.07	- .02	9.6	-0.4	0.15	-0.51	N.W.
Qu'Appelle, Assiniboia.....	27.69	30.11	+ .04	7.6	-7.4	0.29	-0.35	SW.
Medicine Hat, Assiniboia.....	27.58	30.01	- .02	17.1	-10.4	0.23	-0.16	W.
Swift Current, Assiniboia.....	27.34	30.09	- .01	12.6	-10.4	0.98	+0.16	SW.
Calgary.....	26.30	30.00	- .04	19.0	-5.0	0.15	-0.61	N.
Spences Bridge, B. C. ....	29.02	29.86	.....	37.8	.....	0.94	.....	E.
Edmonton, Alberta.....	27.54	30.01	+ .03	16.8	-9.2	T.	-0.65	SE.
Battleford, Saskatchewan.....	28.21	30.07	.....	5.0	.....	0.02	.....	SE.
Hamilton, Bermuda.....	29.88	30.04	- .04	61.8	.....	9.52	.....	SW.
February, 1893.								
Prince Albert, Sas.....	28.48	30.16	.....	-7.5	.....	0.33	.....	W.

Table of miscellaneous meteorological data for March, 1893—Weather Bureau observations.

Districts and stations.	Elevation above sea level, feet.	Length of record, years.	Pressure, in inches.		Temperature of the air, in degrees Fahrenheit.					Humidity and precipitation.					Wind.			Mean temperature data since opening of station.											
			Mean pressure, 8 a. m. and 8 p. m., + z.	Mean reduced.	Departure from normal.	Mean max. and min., + z.	Departure from normal.	Maximum.	Minimum.	Mean minimum.	Greatest daily range.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal.	Days with or more.	Total movement, miles.	Prevailing direction.	Maximum velocity.			Cloudless days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Highest for month.	Year.	Lowest for month.	Year.
																			Miles per hour.	Direction.	Date.								
New England.																													
Eastport.....	53	20	29.91	29.97	31.0	28.4	31.0	28.4	28.4	68	3.96	0.2	8,448	nw.	31	e.	15	9	9	13	6.0	33.4	1881	22.8	1885				
Portland.....	103	22	29.89	30.00	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	31	e.	12	14	10	10	5.0	35.8	1878	23.2	1872				
Manchester.....	247	7	29.75	30.02	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	30	sw.	16	11	7	10	5.0	35.6	1889	27.4	1887				
Northfield.....	872	7	29.75	30.02	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	30	n.	4	3	20	8	6.0	29.5	1889	21.1	1887				
Boston.....	125	23	29.90	30.04	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	48	ne.	10	11	4	16	6.0	34.6	1889	37.4	1888				
Nantucket.....	14	7	30.01	30.02	30.0	30.0	30.0	30.0	30.0	68	3.96	0.2	8,448	nw.	51	nw.	2	13	5	10	5.4	35.1	1871	26.8	1881				
Woods Holl.....	15	7	30.01	30.02	30.0	30.0	30.0	30.0	30.0	68	3.96	0.2	8,448	nw.	48	ne.	10	11	4	16	6.0	34.6	1889	37.4	1888				
Vineyard Haven.....	7	7	30.01	30.02	30.0	30.0	30.0	30.0	30.0	68	3.96	0.2	8,448	nw.	51	nw.	2	13	5	10	5.4	35.1	1871	26.8	1881				
Block Island.....	27	13	30.02	30.05	30.0	30.0	30.0	30.0	30.0	68	3.96	0.2	8,448	nw.	60	ne.	10	10	12	9	5.7	37.9	1882	39.8	1885				
Narragansett Pier.....	11	11	30.02	30.05	30.0	30.0	30.0	30.0	30.0	68	3.96	0.2	8,448	nw.	44	ne.	10	13	9	10	5.0	43.4	1878	26.9	1885				
New Haven.....	107	21	29.94	30.04	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	30	nw.	2	9	11	11	5.7	41.5	1878	26.7	1872				
New London.....	47	23	29.99	30.04	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	30	nw.	2	9	11	11	5.7	41.5	1878	26.7	1872				
Mid. Atlantic States.																													
Albany.....	85	20	29.96	30.06	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	44	se.	21	7	10	14	6.3	38.8	1882	23.1	1885				
New York, N. Y.....	185	23	29.96	30.06	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	40	nw.	16	7	14	10	5.9	43.8	1878	28.9	1872				
Harrisburg.....	377	5	29.97	30.09	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	36	nw.	5	10	9	12	5.0	40.8	1889	33.0	1892				
Philadelphia.....	117	23	29.95	30.08	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	37	n.	8	10	13	12	5.9	48.6	1871	30.8	1885				
Atlantic City.....	53	20	30.04	30.07	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	48	ne.	10	9	13	13	5.7	43.6	1878	31.4	1885				
New Brunswick.....	179	23	29.98	30.08	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	36	nw.	15	11	11	9	5.1	49.1	1878	33.5	1885				
Baltimore.....	112	23	29.97	30.10	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	36	nw.	4	11	8	12	5.0	44.9	1878	34.5	1885				
Washington, D. C.....	19	23	29.98	30.10	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	40	nw.	4	11	8	12	5.0	44.9	1878	34.5	1885				
Cape Henry.....	685	22	29.94	30.10	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	40	nw.	4	11	8	12	5.0	44.9	1878	34.5	1885				
Lynchburg.....	57	23	30.03	30.10	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	45	nw.	4	13	5	13	5.5	55.1	1871	40.8	1885				
Norfolk.....	37	23	30.03	30.10	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	45	nw.	4	13	5	13	5.5	55.1	1871	40.8	1885				
S. Atlantic States.																													
Charlottesville.....	773	15	29.93	30.09	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	37	nw.	14	14	4	13	4.9	54.6	1879	45.3	1885				
Hatteras.....	11	13	30.09	30.10	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	56	nw.	4	12	7	12	5.0	53.3	1884	44.4	1885				
Kittyhawk.....	9	17	30.06	30.07	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	60	n.	4	14	4	13	5.3	53.1	1878	41.7	1885				
Raleigh.....	388	7	29.67	30.10	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	34	nw.	4	11	7	13	5.7	49.6	1890	45.2	1891				
Southport.....	31	18	30.06	30.09	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	36	nw.	4	12	9	10	4.8	58.4	1878	45.8	1885				
Wilmington.....	78	23	30.03	30.11	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	38	nw.	4	12	11	10	5.6	50.3	1871	48.0	1872				
Charleston.....	52	23	30.07	30.12	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	44	w.	4	10	15	6	5.0	62.5	1871	52.1	1872				
Columbia.....	209	22	29.91	30.15	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	44	nw.	4	13	7	11	4.9	61.3	1878	49.9	1885				
Augusta.....	98	23	30.02	30.13	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	44	nw.	4	12	7	11	4.9	61.3	1878	49.9	1885				
Savannah.....	26	23	30.02	30.13	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	44	nw.	4	12	7	11	4.9	61.3	1878	49.9	1885				
Jacksonville.....	43	22	30.07	30.12	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	48	nw.	4	12	9	10	5.0	68.1	1880	57.6	1885				
Florida Peninsula.																													
Jupiter.....	28	6	30.08	30.11	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	34	nw.	4	22	7	2	3.1	69.6	1891	64.8	1889				
Key West.....	22	23	30.11	30.13	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	50	sw.	27	19	9	3	3.7	66.4	1894	69.4	1889				
Mico.....	36	20	30.09	30.13	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	36	sw.	17	11	5	8	5.0	.....	.....	.....	.....	.....			
Tampa.....	36	20	30.09	30.13	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	36	sw.	17	11	5	8	5.0	.....	.....	.....	.....	.....			
Titusville.....	44	6	30.09	30.13	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	46	n.	25	19	4	8	3.5	65.4	1891	61.5	1889				
Eastern Gulf States.																													
Atlanta.....	1,131	15	29.91	30.13	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	44	nw.	4	11	10	10	5.0	57.0	*	47.0	*				
Pensacola.....	56	14	30.05	30.11	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	41	nw.	4	16	6	9	4.5	65.4	1880	54.8	1885				
Auburn.....	12	23	30.05	30.11	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	41	nw.	4	14	8	10	5.0	58.0	1882	48.2	1892				
Mobile.....	57	23	30.05	30.11	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	44	nw.	4	14	8	9	4.7	65.1	1882	53.5	1885				
Montgomery.....	257	21	29.83	30.11	29.4	29.4	30.0	29.4	29.4	68	3.96	0.2	8,448	nw.	41	nw.	3	13	3	15	5.3	62.6	1878	51.7	1885				
Meridian.....	338	23	29.72	30.12	2																								



[illegible]

NOTE.—The data at stations having no departures are not used in computing the district averages. Letters of the alphabet denote number of days missing from the record.  
 \* Two or more directions, dates, or years. † Received too late to be considered in departures, etc. ‡ All barometer, temperature, and precipitation normals, and extremes of temperature are obtained from Fort Assiniboine records. § From 23 days of maximum and 31 days of minimum record. Corrections: January, 1893, Saint Vincent, make precipitation 1.50 instead of 0.15. February, 1893, Saint Vincent, make precipitation 1.00 instead of 0.10.

## CONTRIBUTIONS AND ORIGINAL ARTICLES.

## THE VIOLENT STORMS OF MARCH, 23, 1893.

[By H. A. HASEN.]

Since 1890 a circular has been sent to every town or post office from which any word, either in the newspapers or elsewhere, has appeared regarding a destructive windstorm at that place. On March 23 the newspapers were full of accounts of destructive storms in Indiana, Illinois, Kentucky, Tennessee, and Mississippi. Nearly seventy places were mentioned, and replies to forty-seven of the circulars sent out will be found in the accompanying table.

At 8 p. m. of the 22d the general storm was in Oklahoma, with a pressure at the center of 29.4 inches. In the next twelve hours the center had moved to north Missouri, and the pressure was 29.44. At 8 p. m. of the 23d the general storm was central in Illinois, pressure 29.36. Most of the violent storms occurred in the southeast and south quadrants of this larger storm. An examination of the tracks of the storms shows that they occurred in lines running toward the northeast, as is usually the case. Also, in the table, in the column headed "moved," we find that with a very few exceptions, the observed direction of each storm, as indicated by the debris, was the same, or northeast.

An attempt has been made to separate these different tracts into thirteen groups, and the table shows each group. Four of the forty-seven replies show no marked storm. The times of the storms in general show a regular progression, though there are some exceptions. In eleven cases the funnel cloud was seen, though in nine it was too dark to see. In only three cases is there a failure to record thunderstorm as accompanying the violent wind. A loud roar was heard in all but four places. The occurrence of a whirl is not easily determined, and in nearly all cases it is probable that this was looked for in the

funnel itself. It is now well known that the evidence of a whirl and its direction of rotation from the cloud itself is very deceptive, and that one must rely upon the direction of debris, unless he is only 500 feet from the funnel, and even then the eye is liable to be greatly deceived by the appearances. The remarkable thing is, that four of the reports indicate a whirl *with* the hands of a clock, and only two counter-clockwise. One report has the whirl "toward center from both sides." Two reports of a whirl are not definite enough to determine the direction. Sixteen cases report no whirl. We must infer that very often there are very destructive storms going in the same general direction to the northeast, some of which do not show evidence of a whirl.

In sixteen cases the debris were left in the line of the storm, that is, lying in the direction of the storm or inclined toward the center. Only one reports debris in circular shape, and another reports "every way." Attention is called to the importance of this observation, and the extreme ease with which it may be made. Every storm which has a definite track must show some disposition of debris, and it is very much to be hoped that every one reporting such storm will pay particular attention to the distribution of the debris, trees, etc., in the center line of the storm, and on the left and right of this line. The number of persons reported killed is 19. The last column showing the loss to property, not to crops or fruit, is the most unsatisfactory of all, and is given merely as an approximation. In many cases it would appear that the loss is given for a very large region, and not for the town from which the report comes. Also, oftentimes the description in one town is for the storm in a neighboring town, and the latter sends its own report, so that the report is duplicated. This question of the actual destruction of structures in any town is one of the most important of all, and it is quite unfortunate that there is so much uncertainty regarding it.

## Data relating to the violent storms of March 23, 1893.

Station.	Time.	Funnel.	Thunderstorm.	Roar.	Moved.	Whirl.	Débris left.	Glow in cloud.	Two clouds.	Persons killed.	Loss to property.
Oklahoma City, Okla. <sup>1</sup>	21-00	Yes .....	After .....	Yes .....	ne.	Clockwise .....	South side inward..	Around cloud ..	Single ....	None ...	\$15,000.
Jackson, Tenn.	17-00	Yes .....	Heavy .....	Yes .....	ne.	.....	.....	Light green ....	Yes .....	None ...	Severe.
Spring Creek, Tenn.	17-15	Yes .....	Heavy .....	Yes .....	ne.	No .....	Mostly to ne .....	Yes .....	w. and s. ....	None ...	\$800.
Do .....	18-00	No .....	Moderate.	Yes .....	nw.	No .....	All to nw .....	None .....	No .....	None ...	\$500.
Luray, Tenn. <sup>2</sup>	19-30	No .....	Light .....	Slight .....	nw.	No .....	.....	Greenish .....	No .....	None ...	.....
Dresden, Tenn.	17-30	No .....	Slight .....	Yes .....	ne.	Clockwise .....	All to ne. ....	Rather light....	No .....	None ...	Several thousand.
Murray, Ky.	17-50	Yes .....	Light .....	Yes .....	ne.	From se. to nw...	Fell together....	Smoky .....	Yes .....	1 .....	\$30,000.
Clarksville, Tenn.	19-30	No .....	Light .....	.....	ne.	.....	.....	.....	.....	None ...	Few hundred.
Hopkinsville, Ky.	21-30	No .....	Light .....	Slight .....	ne.	No .....	.....	.....	No .....	None ...	\$50,000 in county.
Pembroke, Ky.	19-15	Too dark.	Light .....	.....	ne.	e. to w .....	Direction of storm.	Peculiar .....	Yes .....	None ...	\$50,000.
Guthrie, Ky.	19-15	Too dark.	Heavy .....	Yes .....	ne.	.....	Same as storm ..	.....	.....	None ...	.....
Bowling Green, Ky.	19-30	No .....	Yes .....	Yes .....	ne.	None .....	.....	No .....	No .....	None ...	\$20,000.
Danville, Ky.	22-00	No .....	Moderate.	No .....	ne.	None .....	.....	No .....	No .....	None ...	None.
Rowland, Ky.	23-30	Too dark.	Heavy .....	Yes .....	ne.	.....	.....	No .....	.....	None ...	\$10,000.
Nashville, Tenn.	21-55	None .....	.....	.....	.....	.....	.....	.....	.....	None ...	15 to 20 buildings.
Gallatin, Tenn.	19-30	No .....	Yes .....	Slight .....	.....	No .....	.....	Yes .....	No .....	None ...	Slight.
Boxville, Ky.	18-30	Yes .....	Heavy .....	Yes .....	ne.	No .....	.....	.....	.....	None ...	None.
Henderson, Ky.	18-45	No .....	Heavy .....	Yes .....	nne.	No .....	Same as storm ..	No .....	No .....	None ...	None.
Evansville, Ind.	18-30	No .....	Yes .....	Yes .....	nw.	No .....	.....	.....	.....	None ...	\$75,000.
Chandler, Ind.	18-40	Not seen.	Heavy .....	Yes .....	n.	.....	Same as storm ..	Yes .....	.....	None ...	\$5,000.
Boonville, Ind.	19-00	Too dark.	Heavy .....	Yes .....	nw.	Yes .....	.....	.....	.....	1 .....	Nearly \$70,000.
Huntingburg, Ind.	19-00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Crawfordsville, Ind.	12-00	No .....	Heavy .....	.....	ne.	.....	.....	Black .....	Yes .....	None ...	None.
Loogootee, Ind.	19-00	Yes .....	Yes .....	Yes .....	ene.	.....	.....	No .....	No .....	None ...	\$5,000.
Mitchell, Ind. <sup>3</sup>	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bedford, Ind.	19-30	Too dark.	Light .....	Yes .....	ne.	No .....	With storm .....	.....	.....	None ...	\$30,000 to \$50,000.
Morgantown, Ind.	.....	.....	.....	.....	.....	.....	.....	.....	.....	None ...	Mostly fences.
Brooklyn, Ind.	20-45	Yes .....	Heavy .....	Yes .....	ne.	.....	.....	White .....	.....	None ...	\$5,000.
Mooreville, Ind.	20-30	.....	Yes .....	Yes .....	ne.	.....	.....	.....	.....	None ...	None.
Greenwood, Ind.	21-00	No .....	Light .....	No .....	n.	No .....	With storm .....	Fiery .....	.....	None ...	Slight.
Indianapolis, Ind.	20-28	No .....	Yes .....	No .....	ne.	No .....	do .....	No .....	No .....	None ...	\$6,000.
Brownburg, Ind.	21-30	Too dark.	Yes .....	Yes .....	ne.	No .....	.....	.....	.....	None ...	Barns.
McCordsville, Ind.	20-30	Too dark.	Heavy .....	Yes .....	ne.	Clockwise .....	.....	.....	.....	None ...	\$10,000.
Tipton, Ind. <sup>4</sup>	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Alexandria, Ind.	21-00	Too dark.	Light .....	Yes .....	ne.	No .....	With storm .....	.....	.....	1 .....	\$3,000.
Crawfordsville, Ark.	15-00	Yes .....	Some .....	Yes .....	ne.	No .....	do .....	Greenish .....	nw. and sw	None ...	\$10,000.
Shaw, Miss.	16-00	No .....	Light .....	Slight .....	ne.	.....	.....	Green .....	No .....	None ...	\$300 to \$500.
Cleveland, Miss.	16-00	No .....	Heavy .....	No .....	ne.	No .....	.....	.....	.....	None ...	None.
Renova, Miss.	16-30	Yes .....	Heavy .....	Yes .....	ne.	Clockwise .....	.....	Dark yellow...	.....	None ...	\$500.
Kelly, Miss. <sup>5</sup>	15-58	Yes .....	Heavy .....	Yes .....	ne.	Counter clockwise	With storm mostly.	No .....	Yes .....	3 or 4	\$150,000 all about.
Olive Branch, Miss.	15-58	Yes .....	Heavy .....	Yes .....	ne.	.....	Every way .....	.....	.....	.....	\$150,000.
Richland, Miss. <sup>6</sup>	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ellisville, Miss.	18-00	.....	Yes .....	Yes .....	ne.	.....	.....	.....	.....	2 .....	6 or 7 houses.
Archibald, La.	16-00	Yes .....	Heavy .....	Yes .....	ne.	To center from both sides.	With storm mostly.	Yes .....	Yes .....	7 .....	\$25,000.
Vosburg, Miss. <sup>7</sup>	1-30	Too dark.	Heavy .....	Very heavy.	e.	.....	.....	.....	.....	Several	.....
Shubuta, Miss.	3-15	No .....	Light .....	Very great.	ne.	Counter clockwise	In a whirl .....	Reddish brown.	.....	3 .....	Slight.
Tupelo, Miss. <sup>6</sup>	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

<sup>1</sup> March 22.<sup>2</sup> 15 miles west.<sup>3</sup> Storm passed over or around.<sup>4</sup> 4 miles south.<sup>5</sup> Same as next.<sup>6</sup> No storm.<sup>7</sup> March 24; 3 miles south.



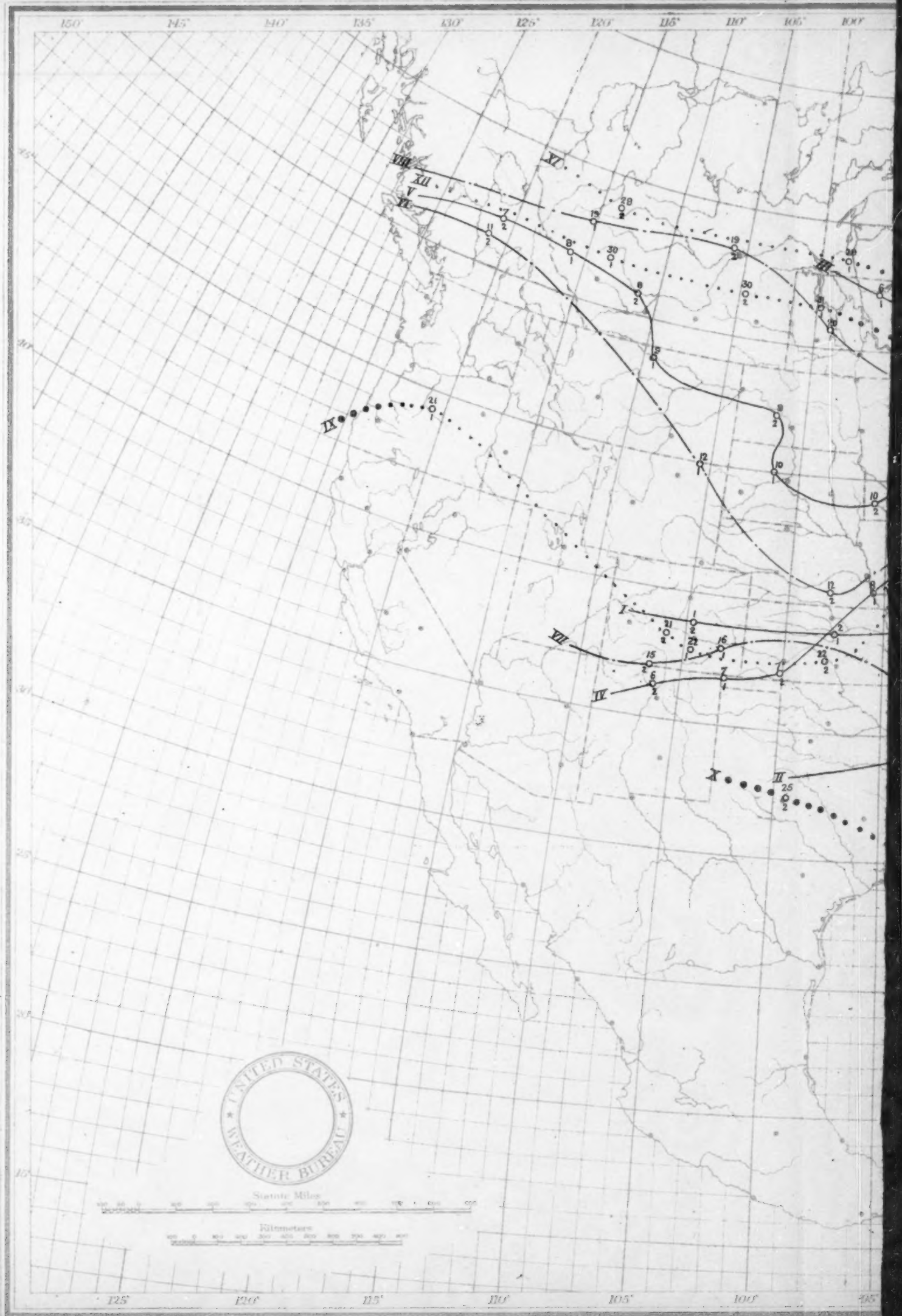
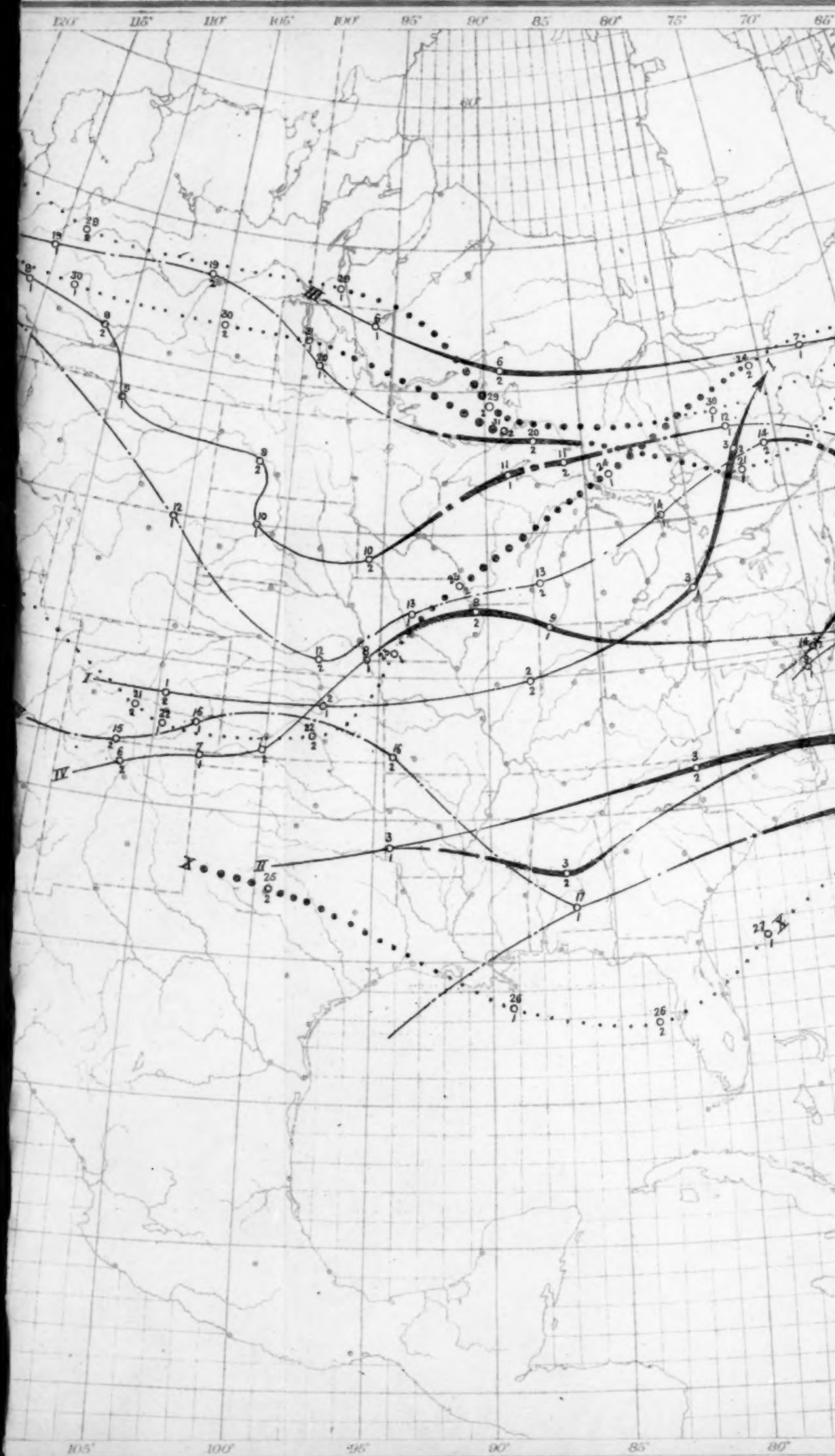
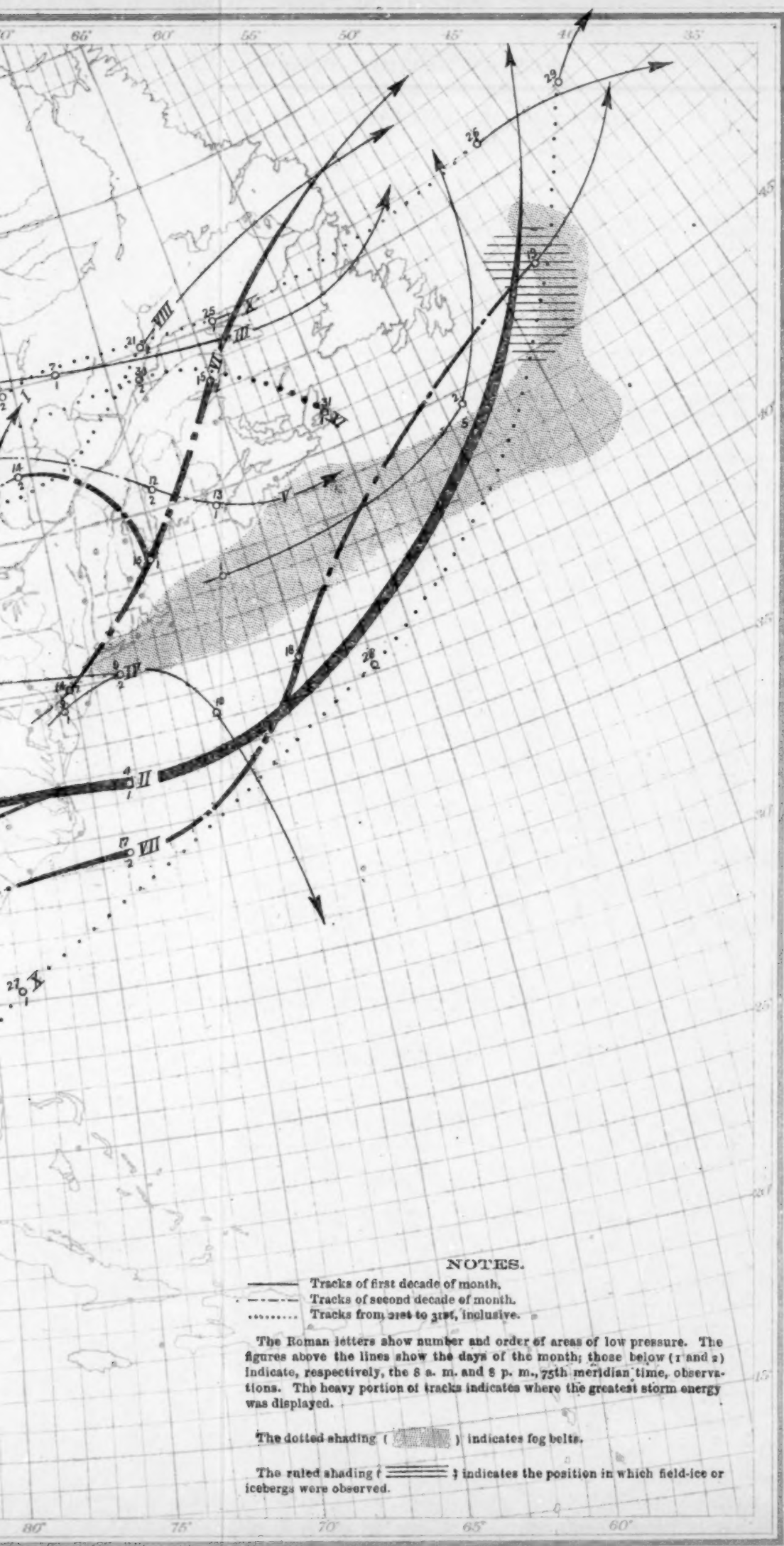


Chart I. Tracks of areas of Low Pressure. March, 1893.







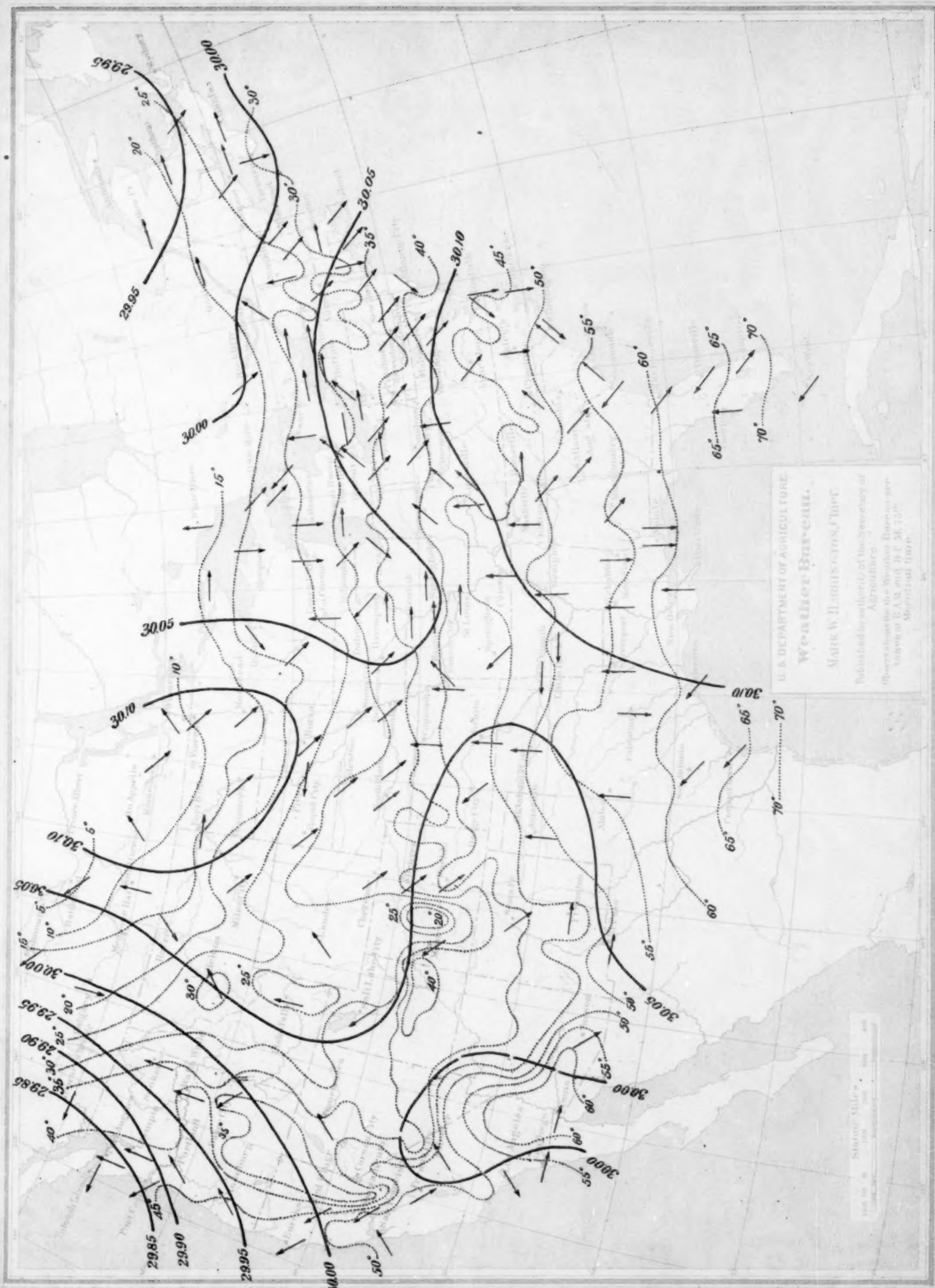
*[Faint, illegible handwriting in the upper left corner]*

*[Faint, illegible handwriting in the middle left section]*

*[Faint, illegible handwriting in the lower left corner]*



Chart II. Isobars, Isotherms, and Winds. March, 1893.



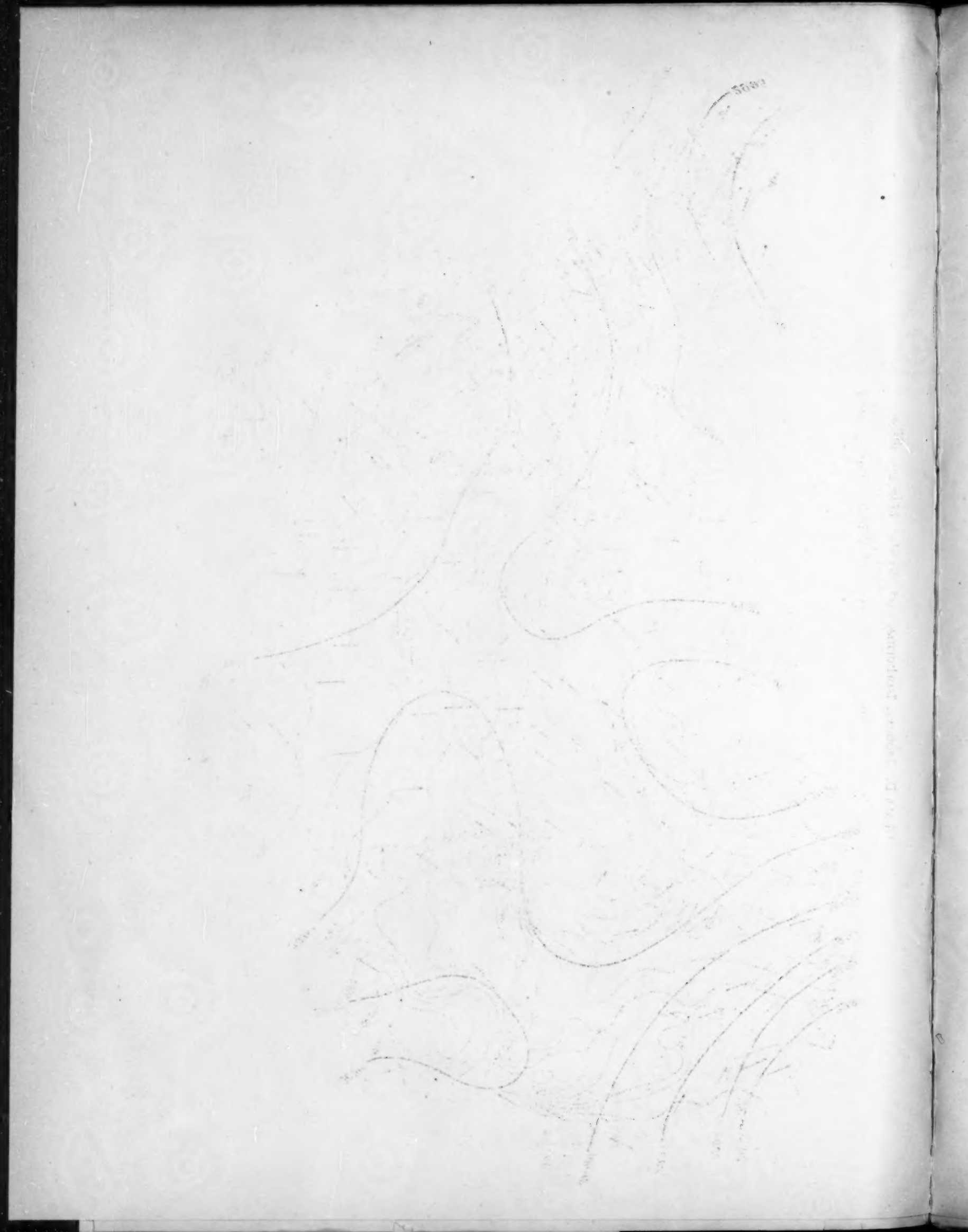




Chart III. Precipitation. March, 1893.

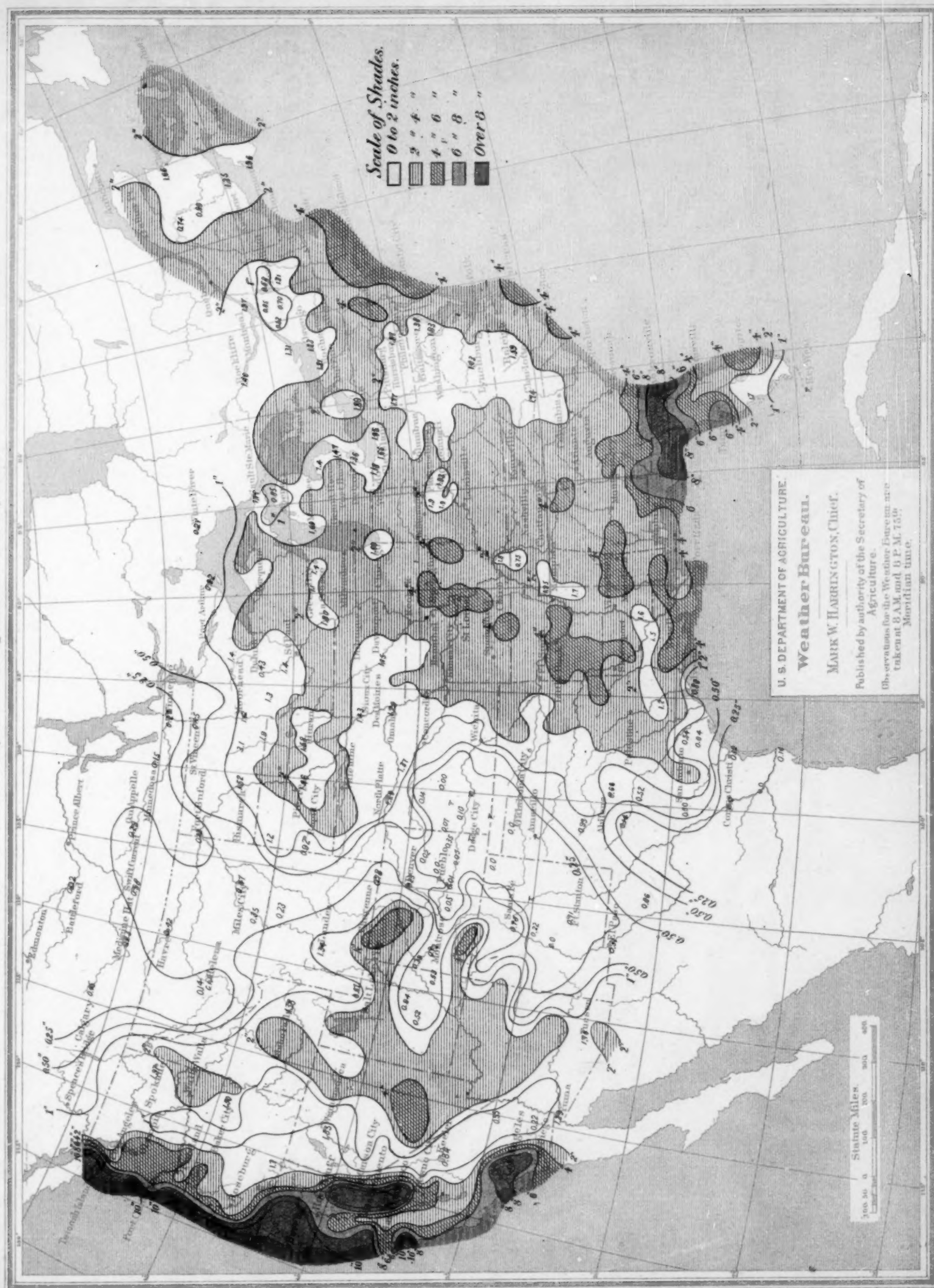
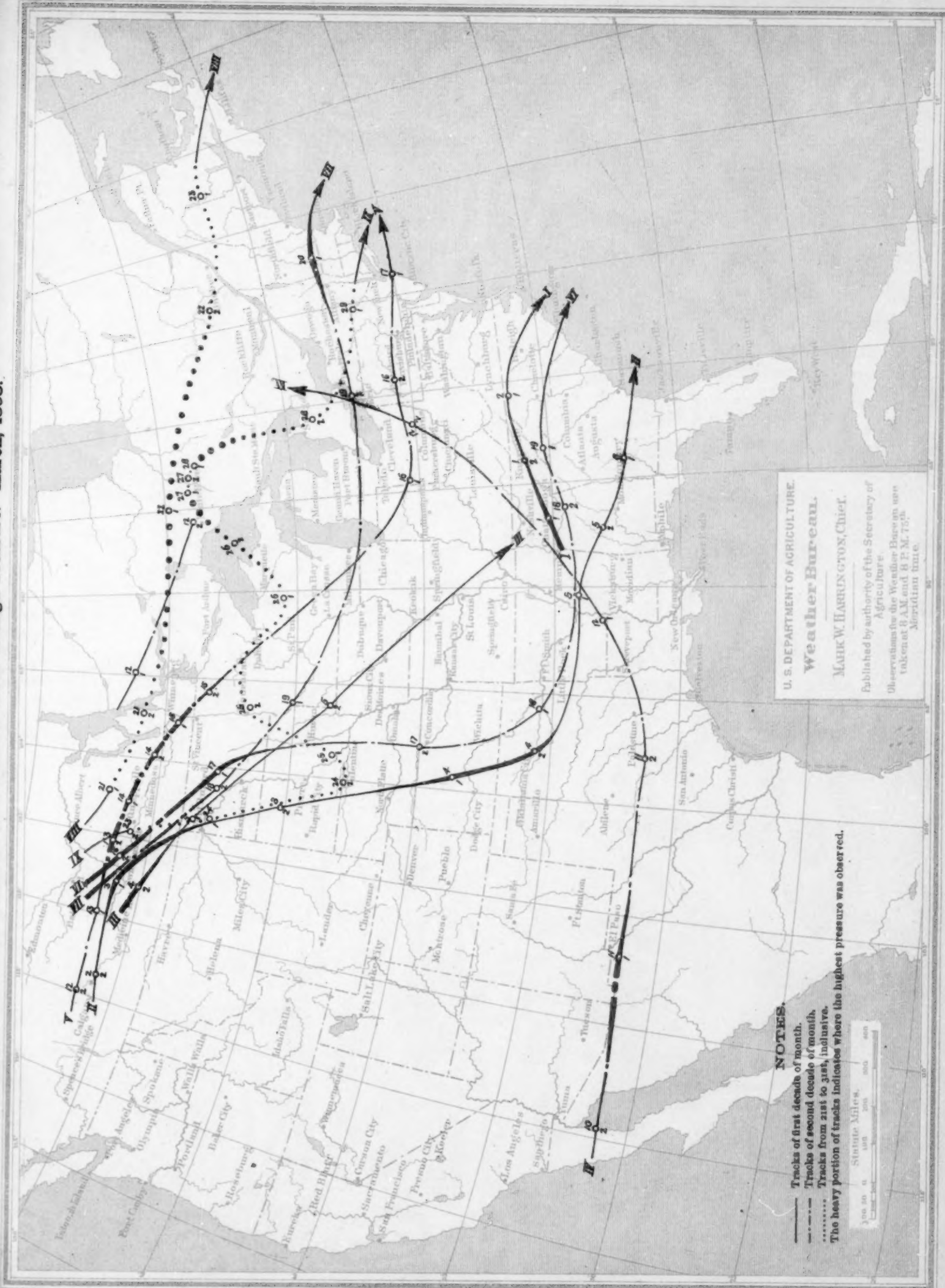




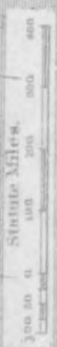


Chart IV. Tracks of areas of High Pressure. March, 1893.



U. S. DEPARTMENT OF AGRICULTURE.  
**Weather Bureau.**  
 MARK W. HARRINGTON, Chief.  
 Published by authority of the Secretary of Agriculture.  
 Observations for the Weather Bureau are taken at 8 A.M. and 8 P.M. 75th Meridian time.

**NOTES.**  
 — Tracks of first decade of month.  
 - - - Tracks of second decade of month.  
 . . . Tracks from 21st to 31st, inclusive.  
 The heavy portion of tracks indicates where the highest pressure was observed.



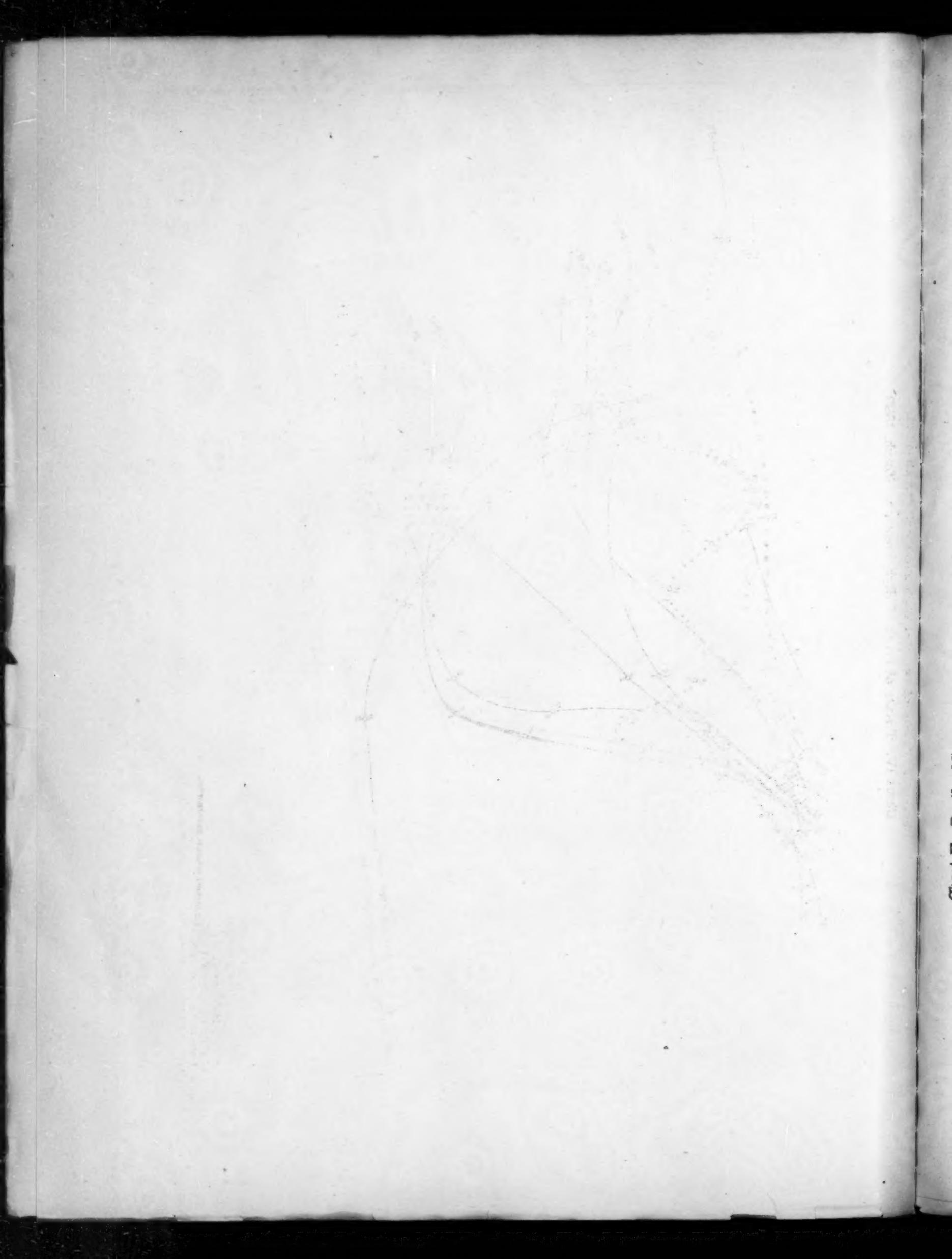




Chart V. Depth of Snowfall (inches) and Limits of Freezing Weather, March, 1893.

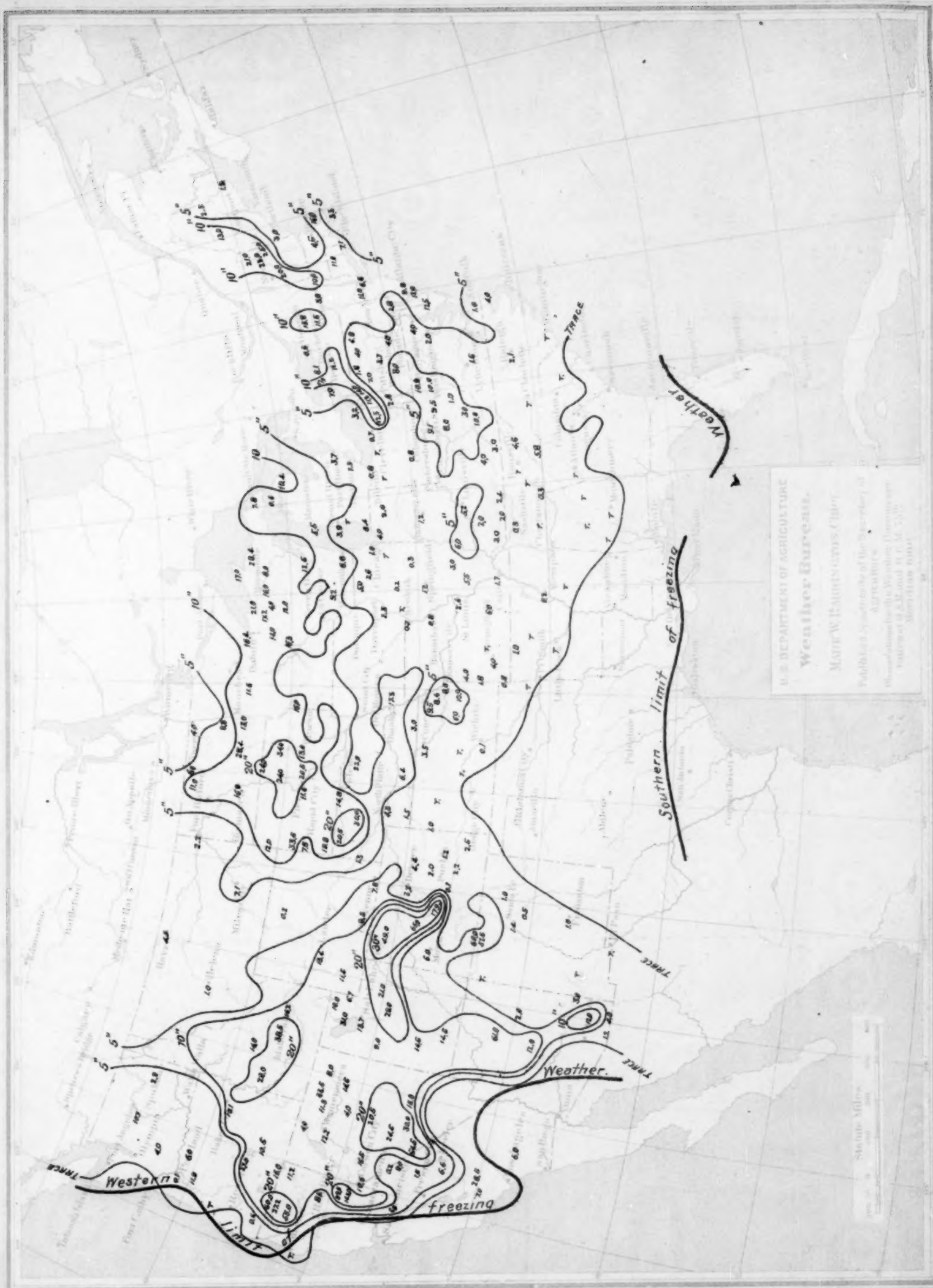
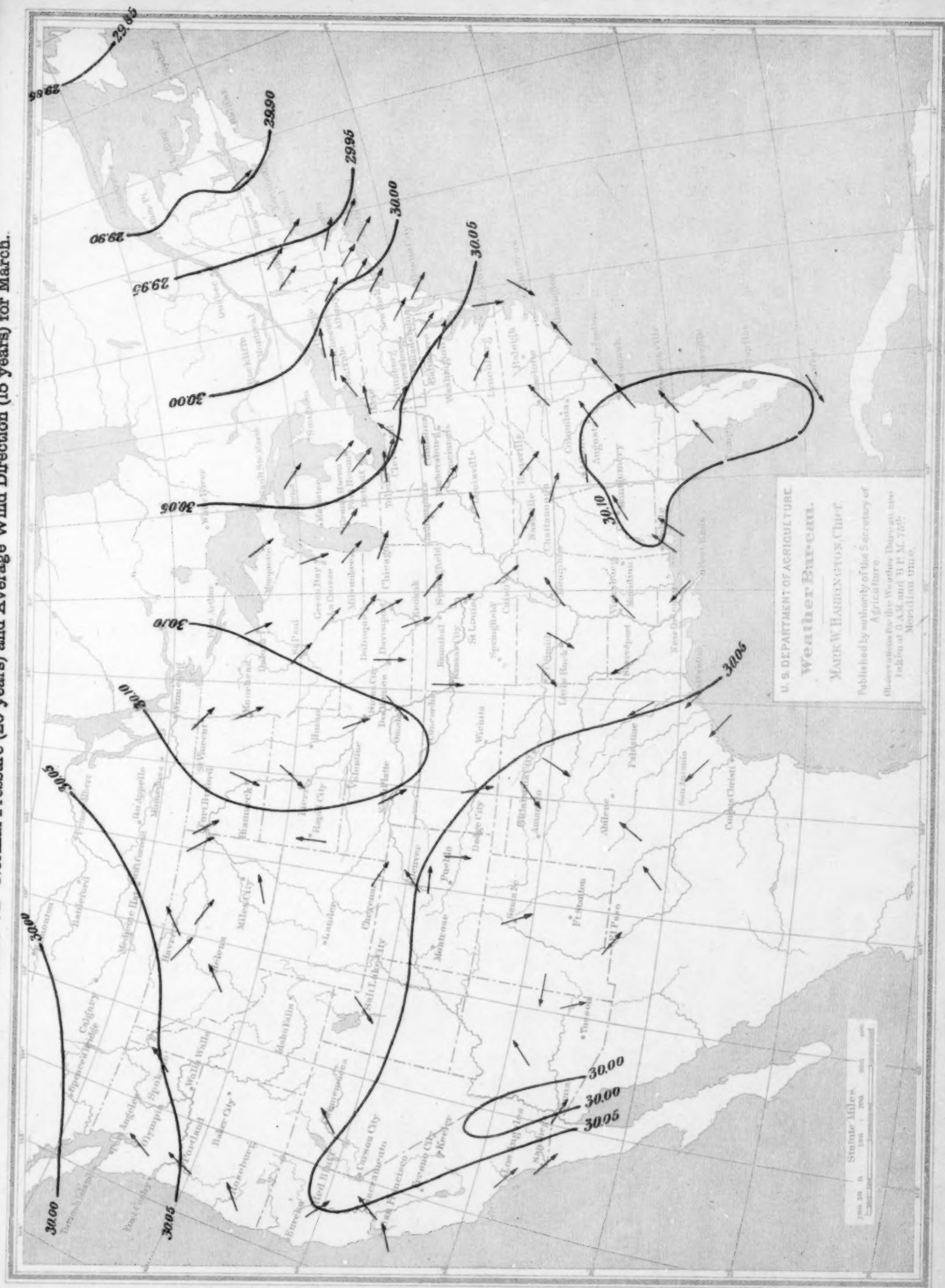






Chart VI. Normal Pressure (20 years) and Average Wind Direction (15 years) for March.





THE UNIVERSITY OF CHICAGO PRESS



*List of voluntary observers of the Weather Bureau, who furnish meteorological reports for the Monthly Weather Review.*

<b>Alabama.</b>	S J Starmer (Ariz Canal Co's dam)	Agent A & P R R Winslow Ariz	Edwin Rhodes Chino Cal	Josiah Keep Mills College Cal
John M Ackley Alco Ala	Phoenix Ariz	T D Bridger (Wood Cañon)	J F Beale Citrus Cal	J H Southwick Milton Cal
Prof P H Mell X Auburn Ala	Rev J G Pritchard Bisbee Ariz	San Simon Ariz	Pomona College Claremont Cal	C E Prindle Mokelumne Hill Cal
Wm Fowler Bermuda Ala	J S Day Buckeye Ariz	<b>Arkansas.</b>	J G Heald Cloverdale Cal	George North (Mt Glenwood)
W J Holland Brewton Ala	E K Sykes Calabasas Ariz	J E Scanlan Bee Branch Ark	John T Britton Colusa Cal	J S Mockabee Mountain View Cal
Dr J G Michael Citronelle Ala	D D Ross (Chiracahua Mt)	A L Morgan Camden Ark	D S Sartwell Crescent City Cal	Wm H Martin Napa Cal
J P Van Derveer Clanton Ala	Edward Vanderlip Crittenden Ariz	A P Robinson Conway Ark	A C Hillman Davisville Cal	H P Aldrich Needles Cal
A M Valerio Daphne Ala	F A Fiege Dragoon Ariz	Jacob Brobst Corning Ark	W W Bliss Duarte Cal	L D Palmer Needles Cal
Morgan D Jones Dozier Ala	George F Cook Dudleyville Ariz	D H Hopkins Dallas Ark	E S Barney Drytown Cal	Sherman W Marsh Nevada City Cal
Chas M Fox Elba Ala	Richard H Farley (Farley's Camp)	Prof G L Teller Fayetteville Ark	J A Edman (Edmanton)	C H Kellogg Newcastle Cal
James Milton Eufaula Ala	Tip Top Ariz	U G McLinden Gaines Landing Ark	S Holland Evergreen Cal	B F Spencer Nordhoff Cal
Richard Smith Florence Ala	C M Funston Flagstaff Ariz	A C Hull Harrison Ark	Fred E Fox Fall Brook Cal	Edw Llewellyn Oakdale Cal
M H Sellars Geneva Ala	A T Colton Florence Ariz	J M Kinser Hope Ark	Mrs W H Robinson Florin Cal	Director Chabot Obs'y Oakland Cal
M H Yerby Greensborough Ala	Post Surgeon Fort Apache Ariz	Post Surgeon U S A Hot Springs Ark	J H Sturges Folsom City Cal	Isaac Cooper Oleta Cal
Dr John Gordon Healing Springs Ala	Post Surgeon Fort Bowie Ariz	Silas C Turnbo (Keesees Ferry Ark)	Post Surgeon Fort Bidwell Cal	W H Edwards (Orangevale)
Samuel Jordon Highland Home Ala	Post Surgeon Fort Grant Ariz	Mrs Isabella M Perrin Kirby Ark	John F Fouts Fouts Springs Cal	L C Jacobs Oroville Cal
H Lamar Jasper Ala	Post Surgeon Fort Huachuca Ariz	M F Locke X Com of Agriculture	C M Fitzgerald Georgetown Cal	G W Smith Palermo Cal
Prof J W A Wright Livingston Ala	Thomas Richey (Fort Mohave)	F H Clark X Little Rock Ark	J J West Glendora Cal	H S Channing Pasadena Cal
U S Engineer Officer (Lock No 4)	Mohave City Ariz	W H Pyburn Lonoke Ark	B F Berriman Grass Valley Cal	Jas Singley Petaluma Cal
A M Weiler Lynn Ala	D Murphy Gila Bend Ariz	Geo L Madding Madding Ark	W J Loutzenheiser Grass Valley Cal	G W Barlow Placerville Cal
Thos Freeman Maple Grove Ala	D Rope Holbrook Ariz	A C Dixon Melbourne Ark	Fred G Moesch Gridley Cal	A G Platt Pleasanton Cal
T C Daniel Maysville Ala	J W Stump (Mt Huachuca)	Capt Joseph Evins Mount Nebo Ark	Guinda Independent Guinda Cal	John Hyslop (Point Lobos)
Wm Garrett Mount Willing Ala	Mrs E S Dodge Oracle Ariz	J W Walker New Gascony Ark	J H Curtiss Healdsburg Cal	Enterprise Porterville Cal
Dr J Huggins Newbern Ala	George W Wells (Oro) Clifton Ariz	Alex Goodrich Osceola Ark	J H Schneider (Hyde Ranch)	Adams Chapin Poway Cal
L C Aday Newburgh Ala	A E Martin Palomas Ariz	E Hail Ozark Ark	E A Brush Hydesville Cal	L F Bassett Redding Cal
J W Clardy Oxanna Ala	G W Bonacker Payson Ariz	Peter Hamilton Rogers Ark	C W Craig Independence Cal	C M Hammond (Red Hill Ranch)
A St C Dunstan Scottsboro Ala	H W Adams Peoria Ariz	Chas A Hinchee Searcy Ark	C F Macey (Iowa Hill)	The Citrograph Redlands Cal
L B Thornton Tuscumbia Ala	Maj T W Hine Phoenix Ariz	E L Buerkle Stuttgart Ark	Dr A Fouch Irvine City Cal	Chas Aull Represa Cal
Wm H Miller Union Ala	Catharine E Langhorne Red Rock Ariz	J F Hurley Warren Ark	T T Tidball Jolon Cal	Kendall Holt Rialto Cal
P L Cowan Union Springs Ala	W W Strohn Reymert Ariz	A H Carrigan Washington Ark	Prof J W McLain Julian Cal	J C Stanton Rio Vista Cal
B M Duggar Uniontown Ala	M E Curry Rye Ariz	Dr A Dunlap Winslow Ark	J F Parks (Kennedy Gold Mine)	W E Keith Riverside Cal
Dr E P Nicholson Valley Head Ala	Post Surgeon San Carlos Ariz	<b>California.</b>	F H Porter (Kono Tayee)	S H Gerrish 1517 G street Sacramento Cal
U S Engineer Officer Wetumpka Ala	John McNeil Show Low Ariz	H B Emerson Agnew Cal	Joseph Dominici Lakeport Cal	J A Barwick X Sacramento Cal
<b>Alaska.</b>	H Koshland Signal Ariz	Miss Winifred S Fry Arcata Cal	Mack Lovelace Lemoore Cal	Dr E K Abbott Salinas Cal
Jos Zuboff Killisnoo Alaska	D D Gowan care F H Nash	Riverside Trust Co Ltd Arlington Heights	Prof A L Colton Lick Observatory	Michael Gorman San Ardo Cal
H S Tibbey Coal Harbor	Strawberry Ariz	W A Webster Bakersfield Cal	Ezra Fiske Lodi Cal	Dr A K Johnson San Bernardino Cal
(Via Sitka and Sand Point) Alaska	Teviston Ariz	Armin O Leuschner Berkeley Cal	F H McCullagh Los Gatos Cal	Dr L Gregory San Jacinto Cal
Dr J D Bluett Metlakahla Alaska	J C Hayden X Tucson Ariz	Biggs Argus Biggs Cal	Maurice Neuman Mariposa Cal	Dr A C Simonton San Jose Cal
(via Ketchikan Alaska)	Walnut Grove Ariz	W C Jones sr Campo Seco Cal	Maxwell Mercury Maxwell Cal	W E Lewis San Luis Obispo Cal
<b>Arizona.</b>	Rucker Ariz	Wm Barry (Centreville)	Pentecost & Reed Middletown Cal	Hugh D Vail Santa Barbara Cal
Mrs J H Hamilton Antelope Valley	Post Surgeon Whipple Barracks	Niles Cal		A Block Santa Clara Cal
(Via Stanton) Ariz	Prescott Ariz			
	C P Smith Wilgus Ariz			

W R Springer Santa Cruz Cal	Wm R Abbott Chivington Colo	H M Knight Lavender Colo	R Z Mason Ward District Colo	Fred L Robertson Brooksville Fla	
L E Blochman Santa Maria Cal	G C Wortman Climax Colo	A G Wallihan (Lay) Craig Colo	Agent U P R R Watkins Colo	Dr J B Rosenberg Clermont Fla	
Crane Bros Saticoy Cal	Jno Parkison Collbran Colo	Chas Green Le Roy Colo	J W Glenn Wilde Colo	F G Brill De Land Fla	
E S Tomblin (Shasta Springs)	Dr S W Morrison X Colorado Springs Colo	Miss Mary Johnson Leslie Colo	A N Turney Yuma Colo	H W O Margary Eustis Fla	
Mrs H A Blockburger (Shelter Cove)	A Reicheneker Como Colo	H L G Brown Livermore Colo	F W Rausch Zuck Colo	Chas Ingall Federal Point Fla	
Robert Hall Sonoma Cal	A A Williams Cope Colo	Dr E J Clark Longmont Colo	<b>Connecticut.</b>		
T G Brown Stockton Cal	Hoyet S Waters Crook Colo	W H McCreery Loveland Colo	H R Stevens (Birmingham)	A H Adams Fort Meade Fla	
T B Sanders Susanville Cal	G W Close Cumbres Colo	S J Perry Manhattan Colo	G J Case Canton Conn	John B Escott Grasmere Fla	
E C Vorheis Sutter Creek Cal	Agent U P R R Deer Trail Colo	W H Clark Meeker Colo	S P Willard Colchester Conn	Thos Roberts Green Cove Springs Fla	
J E Boal (Sweetwater Dam)	W O Stephens Delta Colo	E F Kerr (Middle Box Elder)	M H Dean Falls Village Conn	J S Wade Homeland Fla	
Austin Young (Tehachapi)	J J Gilligan X Denver Colo	W M Stewart Minneapolis Colo	Rev S Hart Hartford Conn	H D Pierce Hypoluxo Fla	
Julius Forrer Greenwich Cal	S J Pratt Dillon Colo	C S Aldrich Monte Vista Colo	W E Boardman Hartford Conn	E R Demain X Jacksonville Fla	
John Tuohy Tulare Cal	S W De Busk Downing Colo	F Beach Monte Vista Colo	New London Water Works (Lake Konomowoc)	W L Van Duzor Kissimmee Fla	
P R McCabe Turlock Cal	I W La Munyon Dumont Colo	A E Sprague Moraine Colo	J H Tucker Lebanon Conn	W B Knight Lake City Fla	
Dr Geo McCowan Ukiah Cal	Christen Jensen (East Dale Colo)	Miss Emma Putnam Orchard Colo	Charles W Hubbard Middletown Conn	C V S Wilson Manatee Fla	
C M Hammond Upper Lake Cal	Agent U P R R First View	J M Wadsworth Pagoda Colo	R R Smith New Hartford Conn	Rev J H White (Merritts Island)	
W H Roscoe Upper Mattole Cal	via Cheyenne Wells Colo	Samuel Wade Paonia Colo	Rev Wm Goodwin New Hartford Conn	A DeLaughter Moseley Hall Fla	
G O Coburn Vacaville Cal	S J Birdsall Fort Collins Colo	P K Barthell Parachute Colo	C H Lathrop North Franklin Conn	Wm Bahrt (Mullett Key)	
Arthur L Webb Ventura Cal	Prof L G Carpenter Fort Collins Colo	H W Goodrich Red Cliff Colo	C H Truesdale North Grosvenor Dale Conn	Miss M M Gardner Myers Fla	
A L Bancroft Walnut Creek Cal	Dr T H Breen Fruita Colo	Dr G D Yokum Rico Colo	G C Comstock Norwalk Conn	Christopher Westall New Smyrna Fla	
A S Noyes West Butte Cal	D D Bloom Garnett Colo	Agent U P R R River Bend Colo	L Andrews Southington Conn	W L Jewett Ocala Fla	
Wm Lumbard Wheatland Cal	J Horace McClelland (Gaynor)	F A Huntley B S A Rocky Ford Colo	K B Loomis South Manchester Conn	S M Morse Orange City Fla	
Williams Farmer Williams Cal	P P Wheaton Georgetown Colo	C T Woods Saint Cloud Colo	Storrs School Exp Sta Storrs Conn	M O Dovel Orlando Fla	
A W Sehorn Willow Cal	Gen W J Palmer X (Glen Eyrie)	C Loman (San Acacia)	Miss E D Larned Thompson Conn	W J Borden Oxford Fla	
J M Case Winchester Cal	Colorado Springs Colo	G C Smith Sanborn Colo	Rev E Dewhurst Voluntown Conn	Wiley Stinson Plant City Fla	
Dr D Ream Yreka Cal	Phil Weidemaier (Glen Eyrie)	E C van Diest San Luis Colo	Mrs B F Harrison Wallingford Conn	J H Hamilton (St Andrews)	
Sutter County Farmer Yuba City Cal	James Hitchings Gold Hill Colo	S J Capps Scissors Colo	N J Welton Waterbury Conn	Post Surgeon (St Francis Barracks)	
<b>Colorado.</b>		John Ross Seibert Colo	S T Stockwell West Simsbury Conn	(St Augustine Fla)	
Miss M A Coles Abbott Colo	R W Guss Greeley Colo	H T Green Sheridan Lake Colo	<b>Delaware.</b>		
Agent U P R R Agate Colo	J H Marshall Greenhorn Colo	Geo Polhill Stamford Colo	John S Jester Dover Del	Theodore G Maltby St Petersburg Fla	
W H Powless Alma Colo	M A Bunker Grover Colo	F M Friend Springfield Colo	Wm C L Carnagy Kirkwood Del	Rev W H Carter Tallahassee Fla	
P W Warnick Amherst Colo	G E Lake Gulch Colo	Hon J H Crawford Steamboat Spring Colo	Rev Lewis W Wells Millsboro Del	C D Webster Tarpon Springs Fla	
T F Burke Arboles Colo	Agent U P R R Hugo Colo	C N C Evers (Sunnyside)	H L Wallace Seaford Del	<b>Georgia.</b>	
Amos Binford (Avoca) Yuma Colo	W Hamp Hugo Colo	Henry Kohler (Surface Creek)	<b>District of Columbia</b>		Dr J P Bowdoin Adairsville Ga
Agent U P R R Bennet Colo	E P Moon Husted Colo	G F Breninger Table Rock Colo	M F Burrows cor 30th and M sts nw	Prof L H Charbonnier Athens Ga	Park Morrill X Atlanta Ga
L A Rawlings Box Elder Colo	F H Stevens Idaho Springs Colo	P Blumer (Thon) Elizabeth Colo	Officer in Charge Washington D C	Care J J Dick & Bro Augusta Ga	Col A P Butler X Care J J Dick & Bro
Dr B A Arbogast Breckenridge Colo	B M Krumpantzky Julesburg Colo	J R Pickett (T S Ranch)	Washington Aqueduct Washington D C	Prof D M Wade Blakely Ga	C E Lee Brag Ga
W E Garver Brush Colo	Mrs N R Walters Kirk (via Fox) Colo	W P Quaintance Whitewater Colo	<b>Florida.</b>		Prof B P Gaillard Dahlonega Ga
Agent U P R R Byers Colo	Agent U P R R Kit Carson Colo	P G Bonewitz Vilas Colo	J Buzzell (Amelia)	R W Cornell Darlen Ga	Wm W Kimzey (Diamond)
Hugh Taylor Castle Rock Colo	L A Norland La Jara Colo	W J King Villa Grove Colo	I B McDonald Avon Park Fla	Dr J T Chappell Dublin Ga	Roy Ga
Miss L M Brooker Cheyenne Wells Colo	G T Herbert Lamar Colo	A Waller Wallet Colo	John D McAliley Bristol Fla		
	A T Gilkison La Porte Colo				
	W E Culver Las Animas Colo				



H A Roebuck Elberton Ga	W P Halliday X (Pres't City Nat'l Bank) Cairo Ill	Godfrey Knetzger Saint John Ill	S B Morris Shelbyville Ind	Dr J Fred Clark Fairfield Iowa
John Axtell Fleming Ga	Public Library X Cairo Ill	John Craig X Springfield Ill	Prof R G Gillum Terre Haute Ind	R Z Latimer Fayette Iowa
T G Scott Forsyth Ga	R O Purviance Carlinville Ill	R Dow Sycamore Ill	Wm W Ross Union City Ind	Dr J W Eckles Fulton Iowa
C W Meaders Gillsville Ga	Wm Rogan Carlyle Ill	C D Crafts Tuscola Ill	Prof J N Roe Valparaiso Ind	Miss L A McCreedy Fort Madison Iowa
T J Holden Hawkinsville Ga	Dr J L R Wadsworth Collinsville Ill	O C Nussle Walnut Ill	Prof C G Boerner Vevay Ind	Dr D W Farnsworth Galva Iowa
R L Rhodes Hephzibah Ga	G W Bright Decatur Ill	O A Watson Watseka Ill	Dr W B Squire Worthington Ind	Seth Dean Glenwood Iowa
R M Crum Homerville Ga	Prof A O Clark Dixon Ill	P J Bates White Hall Ill	<b>Indian Territory.</b>	
O P Walling La Fayette Ga	C L Farrington East Peoria Ill	F Osborne Winnebago Ill	Post Surgeon Fort Supply Ind T	F L Williams (Grand Meadow) Postville Iowa
Dr H H Cary La Grange Ga	E B Schooley Effingham Ill	<b>Indiana.</b>		J G Culver Greenfield Iowa
Prof P Zellars Lincolnton Ga	J M Stine Fairmount Ill	L Stealy Angola Ind	J E Wolf Gwenndale Ind T	Prof S J Buck Grinnell Iowa
G W Warren Louisville Ga	L A Michels Flora Ill	J T Moss Ashboro Ind	B S Thompson Lehigh Ind T	Chas G Rogers Grundy Centre Iowa
A W Latimer Lumpkin Ga	Post Surgeon Fort Sheridan Ill	John Johnson Bedford Ind	Ignatus Spitzer Purcell Ind T	E C Grenelle Hampton Iowa
G S Owen Marietta Ga	Fred U White Galva Ill	C F Hole Butler Ind	Wm Noble South McAlester Ind T	J W Bopp Hawkeye Iowa
J W Frederick Marshallville Ga	T J Trovillion Golconda Ill	Rev E J Spelman Cambridge City Ind	<b>Iowa.</b>	
O P Walling McArthur Ga	Prof M S Oudyn Greenville Ill	Dr N I Kithcart Columbia City Ind	C D Pettibone Algona Iowa	Theodore Marks Hopkinton Iowa
S A Cook Milledgeville Ga	Shirley E Gray Griggsville Ill	J A Perry Columbus Ind	David E Hadden Alta Iowa	Emil F Wulfke Independence Iowa
J J Beck Morgan Ga	J M Ruggles Havana Ill	H Hessler Connersville Ind	Conrad Schadt Amana Iowa	Prof J L Tilton Indianola Iowa
J L Cutler Piscola Ga	A T Purviance Hennepin Ill	Sam D Symmes Crawfordsville Ind	Iowa Agricultural College Ames Iowa	Albert L Arner Iowa City Iowa
C M Witcher Point Peter Ga	W J S Cathcart (Jordans Grove) Sparta Ill	J P White De Gonia Springs Ind	E S King Ames Iowa	J B Parmalee Iowa Falls Iowa
J F Wilson Poulan Ga	Geo McVicker Kankakee Ill	Higginbotham & Son Delphi Ind	Isaac Young Ames Iowa	Dr Chas Enfield Jefferson Iowa
W M Towers Rome Ga	Frank E Sanford La Grange Ill	W J Davisson Farmland Ind	J W Love Atlantic Iowa	Prof John H Landes Keosauqua Iowa
D B Dennis Talbotton Ga	B A Jenkins Louisville Ill	D A Owen Franklin Ind	Prof F P Hocker Audubon Iowa	H B Strever Larrabee Iowa
<b>Idaho.</b>		C W Whitney Hammond Ind	H W Van Dike Belle Plaine Iowa	Mrs M B Stern Logan Iowa
Frank Campbell American Falls Idaho	J B Sheapley Martinsville Ill	J N Latta Hawpach Ind	James Rodgers Blakeville Iowa	Dr A B Bowen Maquoketa Iowa
Post Surgeon Boise Barracks Boise City Idaho	Dr G Leibrock Mascoutah Ill	C F R Wappenhans X Indianapolis Ind	Prof C W Thompson Blockton Iowa	L S Kilborn Marshalltown Iowa
A C Bomar Bonanza City Idaho	J Withington Mattoon Ill	Sylvester Johnson Irvington Ind	Hon B R Vale Bonaparte Iowa	Perry Dexter Mason City Iowa
Post Surgeon (Fort Sherman) Sherman Idaho	W P Gibbs McLeansborough Ill	J C Loomis Jeffersonville Ind	Moses Simon Carroll Iowa	Gust Johnson (Maxon) Albia Iowa
A H Soward Garden Valley Idaho	S S Maxwell Monmouth Ill	Dr T C Hunter Kokomo Ind	Prof A C Page Cedar Falls Iowa	Rev Jos W Hubbard Mechanicsville Iowa
Wood River Times Hailey Idaho	E E Thornton Muddy Valley Ill	Lafe Crosier Laconia Ind	H D Olds Cedar Rapids Iowa	H D Smith Monticello Iowa
J Sherwood (Henry's Lake) Lake Idaho	C W Adams New Haven Ill	Prof H A Huston La Fayette Ind	J I Ong Centerville Iowa	Hon Wm Shriver Mt Ayr Iowa
J H Smith X Idaho City Idaho	C H Fahs Olney Ill	D E Pryor Logansport Ind	Dr J W Smith Charles City Iowa	Dr Max E Witte Mt Pleasant Iowa
D McLoughlin Kootenai Idaho	V E Phillips Olney Ill	J M Johnson Marengo Ind	A S Van Sandt Clarinda Iowa	Prof Alonzo Collin Mt Vernon Iowa
J W Cowden Martin Idaho	Dr W H Chappelle Oregon Ill	Prof J L Massena Marion Ind	Luke Roberts Clinton Iowa	A W Lewis Murray Iowa
University of Idaho Moscow Idaho	J S Seeley Oswego Ill	Milton Reed Markle Ind	A A Berry College Springs Iowa	J P Walton Muscatine Iowa
Dr F B Delano Payette Idaho	Dr J O Harris Ottawa Ill	E Kirkwood Mauzy Ind	J W Bixby Corning Iowa	A Lufkin Newton Iowa
Ferdinand Alers Ruthburg Idaho	J E Templeton (Palestine) Rich Woods Ill	J C Black Michigan City Ind	Gregory Marshall Cresco Iowa	G D Patingill Osage Iowa
<b>Illinois.</b>		J M Lockwood Mount Vernon Ind	Leonard Stranding Decorah Iowa	Jos Boyd Oskaaloosa Iowa
Dr M M Robbins Aurora Ill	J K Eberle Pana Ill	Stevens & Durham Muncie Ind	Wm Ball Delaware Iowa	Wm J Wicks Panama Iowa
W Holden Aurora Ill	Dr F Brendel Peoria Ill	Jonathan Beard New Albany Ind	Ph A Schlumberger Denison Iowa	W A Shaffer Richland Iowa
Prof M J Elrod Bloomington Ill	H A Burr Philo Ill	J F Hood Point Isabel Ind	George M Chappel X Des Moines Iowa	Dr Caleb Brown Sac City Iowa
Dan E Zook Bushnell Ill	Henry B Clark Rantoul Ill	E Jones Princeton Ind	C A Schaffter Eagle Grove Iowa	A J Bond Storm Lake Iowa
	J W James (Riley) Marengo Ill	Dr W N Wirt Rockville Ind	Chas Reinecke Elkader Iowa	J M Rider Tipton Iowa
	T D Robertson Rockford Ill	J A Forsythe Seymour Ind	H Conroy Emmetsburg Iowa	Jos S Boise Villisca Iowa
	N T Veatch Rushville Ill		R M McKean Estherville Iowa	T F McCune Vinton Iowa

W A Cook Washington Iowa	Dr W M Goodwin La Crosse Kans	M T Griggs Wallace Kans	Prof H A Morgan Baton Rouge La	Geo Ingraham Houlton Me
C M Trumbauer Webster City Iowa	F R French Lakin Kans	M L Stone Wamego Kans	Dr L D Chauff Bonnet Carre La	V P Hall (Indian Stream)
Merton L Fuller Williams Iowa	Prof F H Snow Lawrence Kans	Agent U P R R Winona Kans	Maurice Bird North Louisiana Exp Sta'n	Post Surgeon Kennebec Arsenal
Will McKnight Winterset Iowa	C B Jennings Lebo Kans	J W Tipton (Yates Center)	Hon S P Henry Cameron La	Augusta Me
<b>Kansas.</b>	Samuel Pugh Leoti Kans	Toronto Kans	J A White Jr Clinton La	Prof S N Taylor Kents Hill Me
W P Gulick Abilene Kans	C H Rhodes Liberal Kans	<b>Kentucky.</b>	Dr W V Taylor Davis La	Union Water Power Co Lewiston Me
J J Cass Allison Kans	Agent U P R R McAllaster Kans	John E Younglove Bowling Green Ky	Wm P Chandler Farmerville La	F A Perley Mattawamkeag Me
Wm Cheetham Altoona Kans	Ed F Haberlein McPherson Kans	H B Bomar Caddo Ky	Rev Joseph A Raby S J Grand Coteau La	W D Upton Millbridge Me
Prof E B Knerr Atchison Kans	C P Blachly Manhattan Kans	C H Major Canton Ky	W J Schell Hammond La	Maj John L Holoh Presque Isle Me
C A Perdue Beloit Kans	Prof E R Nichols Agricultural College	J W Kirby Carrollton Ky	D W Harris Homer La	C Hopkins West Jonesport Me
C S Culver Bucklin Kans	G F Riley Marion Kans	C E Jones Catlettsburgh Ky	A F Chanfrau Houma La	<b>Maryland.</b>
L C Wilson Buffalo Park Kans	A C Abbott (Marmaton) Fort Scott Kans	J B Atkinson Earlington Ky	G W Whitworth Jeanerette La	C P Cronk Baltimore Md
H E Faidley Burr Oak Kans	J L Steele Minneapolis Kans	Miss Lee Ray Edmonton Ky	Dr Wm Meyer Lake Charles La	A E Acworth Barren Creek Springs Md
A G Alrich Cawker City Kans	A Bahl Monument Kans	T W MacGill Franklin Ky	J G Oldfield Lake Providence La	Calvert Orem Cambridge Md
Chas Burchow Colby Kans	C H Foltz Moreland Kans	L C Alcorn Greensburg Ky	A Werner Lawrence La	F F Brown (Batckerville)
J M Lobaugh Coldwater Kans	R P Edgington Morse Kans	Dr F L Harrod Harrodsburgh Ky	Dr E A Crawford Liberty Hill La	E T Shriver Cumberland Md
Agent U P R R Collyer Kans	John A Gordon Morton Kans	G W Anderson Hendricks Ky	J C Armstrong Many La	H Shriver Cumberland Md
O E Skinner Columbus Kans	H N Renfrew Mount Hope Kans	J J Roberts La Grange Ky	Fred Landry Maurepas La	A F Galbreath Darlington Md
E Shaw Cunningham Kans	H C Williams New England Ranch	J B Kinnard Lancaster Ky	L J Dodge Melville La	F C Ramsdell Denton Md
J B Handy Downs Kans	Grainfield Kans	Chas F See Louisia Ky	Mrs J A Gebert New Iberia La	G W Minnich Easton Md
C W Gilman Elco Kans	Geo W Keys Oberlin Kans	Frank Burke Louisville Ky	R E Kerkam New Orleans La	Chas Feldman Edgemont Md
Geo L Fullinwider El Dorado Kans	D Doyle Oswego Kans	C A Matlock Matlock Ky	Thos Steele Oxford La	Prof G G Curtis Fallston Md
Agent U P R R Ellis Kans	Agent U P R R Page Kans	Geo S Fox Middlesborough Ky	Hon J E Le Blanc Paincourtville La	Wm Fenby Fenby Md
Prof T H Dinsmore Jr Emporia Kans	W T Jackson (Pauline) P O Box 247	James O'Connell Mount Sterling Ky	Prof J E Johnston Plain Dealing La	G Earnest Bantz Frederick Md
C D Perry Englewood Kans	Topeka Kans	J M Brents Munfordville Ky	P G Kleinpeter Plaquemine La	A W Nice Glyndon Md
Ben C Rich Eureka Ranch	F T M Dutcher Phillipsburgh Kans	Wm Bornemann Paducah Ky	Wm A Reed Roseland La	Jos Plummer Jewell Md
Ellis Kans	Agent U P R R Plainville Kans	Oscar Haynes Pellville Ky	E Dechamps Jr Shell Beach La	Geo W Joy Leonardtown Md
Post Surgeon Fort Riley Kans	N A Andress Pleasant Dale Kans	J S Bingham Princeton Ky	Maj S T Grisamore Thibodeaux La	McDonogh Institute McDonogh Md
Chas M Bell Gibson Kans	Agent U P R R Quinter Kans	J Buford Wood Richmond Ky	Geo H Tassin Wallace La	Mt St Mary College Mt St Marys Md
Jesse Royer Gove Kans	D M Adams Rome Kans	T J Ryland Russellville Ky	T A Williams (West End)	Dr Howard H Hopkins New Market Md
Agent U P R R Grainfield Kans	A P Collins Salina Kans	A K Denny Shelby City Ky	Dr W M Guice Winnsborough La	James D Hamill Oakland Md
M H Kenaga Greensburg Kans	J W Goodell Sedan Kans	H W Preissler Shelbyville Ky	<b>Maine.</b>	Lemuel Malone Salisbury Md
R M Lawyer Grenola Kans	Agent U P R R Sharon Springs Kans	A B Gilbert South Fork Ky	Jos Wood Bar Harbor Me	Dr W H Marsh Solomons Md
Agent U P R R Grinnell Kans	W H Harvey Shields Kans	Rev Miles Saunders Springfield Ky	L H Murch Belfast Me	John G Knauer Sunnyside Md
L W Dennen Havensville Kans	A A Denton Sterling Kans	W T Kenyon Vanceburgh Ky	Dr D E Seymour Calais Me	Dr C W Weaver Taneytown Md
Geo P Griffith Hays City Kans	A B Wagoner Syracuse Kans	J O Strouse Versailles Ky	Silas West Cornish Me	John T Cassell Westminster Md
D C Ruth Hesston Kans	Prof J T Lovewell Topeka Kans	Kentucky Heating Gas Co West Point Ky	Frank W Kingsley East Machias Me	Woodstock College Woodstock Md
W S Belden Horton Kans	T B Jennings Topeka Kans	W G Shivell Wickliffe Ky	Nathan M Colbroth Easton Me	<b>Massachusetts.</b>
C Bishir Hutchinson Kans	Washburn College Topeka Kans	F A Gurney Williamsburg Ky	H M Mansfield Fairfield Me	F W Green Adams Mass
J M Altaffer Independence Kans	C E Wightman Tribune Kans	<b>Louisiana.</b>	J M S Hunter Farmington Me	Miss S C Snell Amherst Mass
Dr E R Heath 1115 Garfield Ave	T W Marshall Ulysses Kans	Dr C J Edwards Abbeville La	Vetal Cyr Fort Kent Me	Hatch Experiment Station Amherst Mass
Kansas City Kans	Agent U P R R Wa Keeney Kans	Prof W C Stubbs Sugar Ex Station	Miss E Mabel Moore Gardiner Me	Ag'l Experiment Station Amherst Mass
Jacob Nixon Kellogg Kans	W P Cochran Wakefield Kans	(Audubon Park)		
Wm F Smith Kiowa Kans	Agent U P R R Wallace Kans	New Orleans La		



*List of voluntary observers of the Weather Bureau, etc.—Continued.*

v

A B Wiggin Andover Mass	T R Rodman New Bedford Mass	D B Alger Birch Run Mich	W S Locke McMillan Mich	John Ellingson (Leech Lake)
F K Lathrop Beverly Farm Mass	New Bedford Water Works New Bedford Mass	S Alexander Birmingham Mich	Mrs A R Rogers Montague Mich	Grand Rapids Minn
Prof A L Rotch (Blue Hill) Readville Mass	Newburyport Water Works Newburyport Mass	A Hardy Boon Mich	J A Hartzler Mottville Mich	A W Sheets Long Prairie Minn
Prof W H Niles Boston Mass	C H Kohlrausch Jr North Billerica Mass	David Straehly (Bronson)	Nellie A Mayo (North Marshall)	Geo W Richards Maple Plain Minn
J Warren Smith X U S Weather Bureau	Miss L B Knapp Plymouth Mass	Burr Oak Mich	Battle Creek Mich	E A Beals X Minneapolis Minn
Desmond Fitz Gerald Boston Mass	J R Smith Provincetown Mass	H McNair Brown City Mich	Olivet College Olivet Mich	Wm Cheney Minneapolis Minn
Harvard College Observat'y Cambridge Mass	Mrs I D Page Randolph Mass	Jas White (Caldwell)	W H Faxon Ovid Mich	J H Aschenbeck Minneapolis Minn
E C Brooks (Cambridge)	John S Cheever Roxbury Mass	E S Grierson Calumet Mich	Orr D Marks Paris Mich	H B Waterman Minnesota City Minn
Prof W M Davis X Cambridge Mass	Miss L W Chase Royalston Mass	E H Green Charlevoix Mich	L Marvill Parkville Mich	L G Moyer Montevideo Minn
G W Weeks Clinton Mass	A A Smith Salem Mass	D Woodward Clinton Mich	L R Brown Rawsonville Mich	D T Wheaton Morris Minn
F A Tower Concord Mass	M E Cain Savoy Mass	C W Brown Crystal Falls Mich	Dr W C Gates Rockland Mich	Carleton College Northfield Minn
Conant Observatory Dudley Mass	Elisha Slade Somerset Mass	Edward A Evans X Detroit Mich	O D Thomson Romeo Mich	Dr P A Walling Park Rapids Minn
Geo L Lyon (Egg Rock)	Felderhof South Dennis Mass	Prof J K Osgerby East Tawas Mich	Rev J Ferries St Ignace Mich	Neil McKay (Pine River)
C V S Remington Fall River Mass	Post Surgeon National Armory	Mrs H A Hepburn Evart Mich	W E Nims Sand Beach Mich	J E Walbridge Rochester Minn
O B Truesdell Fiskdale Mass	Dr E U Jones Taunton Mass	L D Watkins (Fairview)	C H Force Stockbridge Mich	Capt F Wherland (Rolling Green)
Dr J Fisher Fitchburg Mass	A F Sprague Taunton Mass	M Conklin Fitchburgh Mich	Dr J S Caulkins Thornville Mich	Patrick Henry (Sandy Lake Dam)
Dr A P Mason Fitchburg Mass	C H Wilmarth Taunton Mass	W L Fisher Flint Mich	A Smith Vandalia Mich	Libby Minn
Elmer S Rice (Florida Mountain)	Dr S W Abbott Wakefield Mass	A Wm Brown Gaylord Mich	V W Eaton (Washington)	L Curry Sheldon Minn
Boston Water Works Framingham Mass	Boston Mfg Co Waltham Mass	Worden Wells Glenwood Mich	J H Forster Williamston Mich	H W Hill St Charles Minn
Dr W E Brown Gilbertville Mass	Mrs F A Smith Wayland Mass	J W Morris Grape Mich	J C Bemiss Ypsilanti Mich	S Marlatt St Cloud Minn
John C Wheeler Great Barrington Mass	E P Morton Webster Mass	Dr O Palmer Grayling Mich	<b>Minnesota.</b>	Rev O A Norman St Oloff Minn
C Woolley Groton Mass	Prof Sarah F Whiting Wellesley Mass	L B Smith Hanover Mich	Fred Audrist Ada Minn	J A Peck Wabasha Minn
Groton School Groton Mass	G S Newcomb Westborough Mass	E S Shaw Harbor Springs Mich	Rev R B Abbott Albert Lea Minn	A F Elfstrom Willmar Minn
H W Cushing Hingham Mass	Williams College Obsy Williamstown Mass	W E Aldrich Harrison Mich	Jos F Heibel Alexandria Minn	A M Pett & Son Winona Minn
C F Sleeper Hyannis Mass	A E Sweetland Winthrop Mass	Dr D W Mitchell Harrisville Mich	C E Crane Alma City Minn	
Essex Company Lawrence Mass	G W Swan Worcester Mass	F H Edwards Hart Mich	Warren S Jackson Bingham Lake Minn	<b>Mississippi.</b>
D E Hoxie Leeds Mass	Worcester Academy Worcester Mass	Dr F R Timmerman Hastings Mich	Dr F L Puffer Bird Island Minn	W L McGee Agricultural College Miss
Leicester Academy Leicester Mass	<b>Michigan.</b>	C F Leipprandt Hayes Mich	C B Pettie Blooming Prairie Minn	W H Swann Briers Miss
W B Hosmer Leominster Mass	W H Howard Adrian Mich	A D DeGarmo Highland Station Mich	J W Klinker Caledonia Minn	Dr G W Smith-Vaniz Canton Miss
Prop Locks & Canals Lowell Mass	Prof C E Barr Albion Mich	E B Rogers Hillsdale Mich	O A Hallim Cambridge Minn	T B Word Clarksdale Miss
F E Saunders Lowell Mass	G W Grigsby Allegan Mich	F W Munson Howell Mich	Jacob Rouse Camden Minn	D H Miller Crystal Springs Miss
M W Graves Ludlow Center Mass	P M Smith Alma Mich	O L Giddings Ivan Mich	W V Davee Clear Lake Minn	Lloyd T Binford Duck Hill Miss
J W Darcey Lynn Mass	R K Palmer Ann Arbor Mich	W Bice Jeddo Mich	Peter Engel Collegeville Minn	C W Barber Edwards Miss
J C Haskell Lynn Mass	Wm Atkin (Arbela)	W A Black Kalamazoo Mich	John Ross Crookston Minn	James E Mills Enterprise Miss
W C Winter Mansfield Mass	F N Hilton (Ball Mt) Pontiac Mich	A G Smith Lake City Mich	D F Akin Farmington Minn	I N Bedford Fayette Miss
Fred W Gow Medford Mass	Mrs Ida McDiarmid Bear Lake Mich	Dr H B Baker Sec State Board of Health	F J Kneeland Fergus Falls Minn	E R Somerville Greenville Miss
Middleborough Water Wk's Middleborough Mass	R O Gould (Berlin) Smith Mich	M M McCormack Lewiston Mich	C F Greening Grand Meadow Minn	Dr Jno Bertrand Hattiesburgh Miss
Rev A K Teele Milton Mass	C Leavitt Bellaire Mich	W T Woodhouse Lyons Mich	B C Finnegan Grand Rapids Minn	L Heyman Kosciusko Miss
W H Allen Monroe Mass	Dr H V Tutton Benton Harbor Mich	H C Bradish (Madison)	J G C Johnson Granite Falls Minn	Capt C D Koch (Logtown) Pearlington Miss
Dr G E Fuller Monson Mass	W J Jones Berrien Springs Mich	Dr G H Green Marshall Mich	S W Anderson Hinckley Minn	B T Webster Louisville Miss
Wm Street (Mount Nonotuck)	F A Zerby Berrien Springs Mich	N Cody Mayville Mich	C Ufford Holland Minn	P E Blumer Moss Point Miss
Mount Tom Mass			Mrs Carrie D Lacy Kinbrae Minn	W H Hill Palo Alto Miss
			Wm Maddy (Lake Winnibigoshish Dam)	Dr C W Bolton Pontotoc Miss
			Grand Rapids Minn	Dan McColl (Ship Island) Biloxi Miss

Prof R B Fulton X University Miss	Jos Milburn Glensted Mo	Dr M E Shelton Poplar Bluff Mo	R H Clendenin Martinsdale Mont	Thos B A Watson Hartington Nebr
Dr A J Sanderson Vaiden Miss	J W Pulliam Gorin Mo	Dr Wm Hiron Princeton Mo	E H Brewster Mingusville Mont	Dr J T Fleming Harvard Nebr
Dr R J Hyatt X Vicksburg Miss	L M Bean Gordonville Mo	G E Bedford Rea Mo	J W Graham (Powder River)	O F Heartwell Hastings Nebr
Prof J Reeves Washington Miss	Lindon Marts Grove Dale Mo	Prof A L McRae Kolla Mo	Eugene Stark Powderville Mont	Wm Waterman Hay Springs Nebr
A Erikson Water Valley Miss	A J Sharp Harrisonville Mo	H H Heiney Round Spring Mo	Virginia City Mont	Dr C M Easton Hebron Nebr
W S Davis Waynesborough Miss	Dr J I Brady Hastain Mo	L C Saeger Saint Charles Mo	<b>Nebraska.</b>	John Lane Holdrege Nebr
Prof Frank A Millidge Woodville Miss	G A Leavitt Houston Mo	Prof F E Nipher X Washington University Saint Louis Mo	R E Bowden Agee Nebr	J M Bird Imperial Nebr
<b>Missouri.</b>	Chas E Keece Humansville Mo	C G Taylor Sedalia Mo	F S Thompson Albion Nebr	H Adams Indianola Nebr
L P Riley Akron Mo	C M Hunt Irena Mo	J S Chandler Shelbina Mo	Peter Fowlie Ansley Nebr	D A Piercy Kennedy Nebr
Edwin May Annapolis Mo	W H Delano Ironton Mo	I N Morris Stanberry Mo	E D Smith Arborville Nebr	D Henderson Jr Kimball Nebr
L T Theilmann Appleton City Mo	C B Lane Jefferson City Mo	E L Hall Steffenville Mo	W F Jenkins Arcadia Nebr	Ira P Griswold Lexington Nebr
J T Armstrong Arthur Mo	Ed J Chubbuck Kidder Mo	G W Goodlett (Stellada) Windsor Mo	Dr A S Mansfelde Ashland Nebr	University of Nebraska Lincoln Nebr
Newburn & Co Bethany Mo	E H Adams Lamar Mo	E A Pinnell Steeleville Mo	F Rein Ashton Nebr	D D Dayton Madrid Nebr
S N Page Big Piney Mo	W D Wade Lamonte Mo	Hon L Spriggs Sublett Mo	C A Wood Auburn Nebr	John Ellis (Marquette) Central City Nebr
L Benecke Brunswick Mo	F M Joslyn Langdon Mo	O J Townsend Unionville Mo	A H Gale Bassett Nebr	J Hull Minden Nebr
J W Wallace Bryant Mo	M W Serl Lebanon Mo	W L Wilson Vancleve Mo	Dr J T Armstrong Beatrice Nebr	Agent B & M Ry Mullen Nebr
J W Jackson Cabool Mo	Chas Tenbuer Lexington Mo	F W May Virgil City Mo	C G George Beaver City Nebr	Prof C D Rakestraw Nebraska City Nebr
W H Lown Canton Mo	J R Eaton Liberty Mo	J R Mayre Vermont Mo	C E Ward Belvidere Nebr	J H Hassinger Nesbit Nebr
Pettit & Welch Carrollton Mo	G W Robinson Linn Creek Mo	Prof J H Frick Warrenton Mo	L F Rector Burwell Nebr	Dr W B Croll Norfolk Nebr
Z T Russell Carthage Mo	W S Gardner Malden Mo	Henry Mansfield Wellsville Mo	O E Cooley Cooleyton Nebr	E W Black North Loup Nebr
H A McNally X Columbia Mo	J W James Mansfield Mo	J A Truex West Plain Mo	Geo B Mair Callaway Nebr	G S Clingman Oakdale Nebr
Levi Chubbuck X Columbia Mo	E R Graham Marble Hill Mo	W H Liggett Wheatland Mo	E M Couch Cornlea Nebr	A U Morris O'Neill Nebr
Fr Odilo Russell Conception Mo	Rev W H Black Marshall Mo	L A Dewey Whiteside Mo	Dr G Roberts Creighton Nebr	F M Larison Ough Nebr
A F McCray Cowgill Mo	Marcus W Wood McCunes Station Mo	<b>Montana.</b>	Prof G D Swezey X Crete Nebr	C C Irwin Paddock Nebr
Wick Morgan Dadeville Mo	Dr. J F Llewellyn Mexico Mo	Will Kennedy Boulder Valley Mont	Robert P Hoxsey Crete Nebr	C Shieldstream Palmer Nebr
W H Broadus Darksville Mo	J D Sanders Mine La Motte Mo	Mrs M W Alderson Bozeman Mont	G A Loveland X Crete Nebr	Edward Arnold Ponca Nebr
J F Rhea Dixon Mo	J M Hasness Mound City Mo	S M Corson Choteau Mont	E B Taylor David City Nebr	E Smith Ravenna Nebr
David Sharp East Lynne Mo	E S Allen Mount Vernon Mo	Geo T Wicks Cokedale Mont	Chas Seltz De Soto Nebr	D F Trunkay Red Cloud Nebr
John S Luthy Edge Hill Mo	A H Helmbrecht New Boston Mo	J D Guerin Columbia Falls Mont	J E Bramblet Dunning Nebr	J A Chadbourne Santee Agency Nebr
J D McFarland Edina Mo	Andreas Olnhausen New Hartford Mo	John Richardson Corbin Mont	A Dahl Ericson Nebr	L E Ost Seward Nebr
J H Sharp Eight Mile Mo	Max Eimbeck New Haven Mo	College of Montana Deer Lodge City Mont	J A Wood Ewing Nebr	G H Rogers Springview Nebr
S Newton Eldon Mo	A I Zeigel New Palestine Mo	S L Pratt Elk Park Mont	Dr I Humphrey Fairbury Nebr	Mark Baldwin Stanton Nebr
Henry Miller Emma Mo	G E Nichols Neosho Mo	Post Surgeon Fort Custer Mont	P B Gailord Fairfield Nebr	C A Skinner (State Farm) Lincoln Nebr
W H Baker Farmersville Mo	E E Steines (Oakfield) Hollow Mo	Post Surgeon Fort Keogh Mont	P Daniels Falls City Nebr	F L Naylor Superior Nebr
Prof T Berry Smith Fayette Mo	Henry Bruhl Oak Ridge Mo	Wm Gaddis Fort Logan Mont	Post Surgeon Fort Robinson Nebr	P W Risser Syracuse Nebr
Fred W Duenckel Forest Park Station	H Montgomery Olden Mo	Post Surgeon Fort Missoula Mont	Post Surgeon (Fort Sidney) Sidney Nebr	G D Carrington Table Rock Nebr
Saint Louis Mo	Wm Kaucher Oregon Mo	Post Surgeon (Camp Poplar River) Poplar Mont	J N Bennett Franklin Nebr	W L Dunlap Tecumseh Nebr
Wm Muir Fox Creek Mo	Sam M Ruley Oregon Mo	J H Ray Glendive Mont	Isaac E Heaton Fremont Nebr	Dr A D Nesbit Tekamah Nebr
Mary A Snyder Fulton Mo	W B Cox Oto Mo	Chas L Herzog Great Falls Mont	F M Flory Geneva Nebr	C F Brown Thedford Nebr
Otto Sims Gainesville Mo	J R Dudley Palmyra Mo	E J Glass X Helena Mont	G S Truman Genoa Nebr	W N Hunter Turlington Nebr
W P Young Gallatin Mo	W S Forsyth Paris Mo	C V Walker Hogan Mont	John P Finley Gering Nebr	George L Folsom Wallace Nebr
H C Crooks Galt Mo	W R McIlvaine Phillipsburgh Mo	C A Wood Horr Mont	J M Callander Haigler Nebr	G Treat Weeping Water Nebr
Geo W Carleton Gayoso Mo	M B W Harman Pickering Mo		A R Dew Harrison Nebr	E G Bruner West Point Nebr
Prof C W Pritchett Glasgow Mo	W A McDowell Platte River Mo			



John L Crossley  
Whitman Nebr  
Mrs C W Le Bar  
Wilcox Nebr  
W H Davis  
York Nebr

**Nevada.**

M D Murphy  
Austin Nev  
J R Harcourt  
Belleville Nev  
G Nicholl  
Belmont Nev  
J G W Mitchell  
Candelaria Nev  
Ford A Carpenter X  
Carson City Nev  
Prof C W Friend  
Carson City Nev  
W T Crane (Crane's Ranch)  
Elko Nev  
D Fowler  
Downeyville Nev  
C H Sproule  
Elko Nev  
M B Garahan  
Ely Nev  
Miss Bessie Potts  
(Empire Ranch)  
Care Geo Nicholl  
Belmont Nev  
G W Dungan  
Genoa Nev  
C P Mengel  
Hawthorne Nev  
C Lewers  
(Lewers Ranch)  
Franktown Nev  
E I Mather  
McDermitt Nev  
C J Adams  
Mill City Nev  
Miss Kate L McGill  
(Monitors Ranch) Ely Nev  
Wm Oothout jr  
Palmetto Nev  
N P Dooley  
Pioche Nev  
State University  
Reno Nev  
L Allen  
St Clair Nev  
A C Pratt (South Camp)  
Wellington Nev  
Mrs Walter Stofiel  
Stofiel Nev  
Wm Harton  
Sunnyside Nev  
Henry F Schult  
Tuscarora Nev  
James B Gilmore  
Tybo Nev  
Prof Mark Averill  
Virginia City Nev  
C H Gordon  
Wabaska Nev

**New Hampshire.**

F W Palmer  
Antrim N H  
O F Cole  
Berlin N H  
Dr Q A Bridges  
Berlin Mills N H  
Benj Tucker  
Bethlehem N H  
G W Bridges  
Brookline N H  
Hon W L Foster  
Concord N H  
H C Allison  
Dublin N H  
Agr Exp Sta  
Durham N H

N A Briggs  
East Canterbury N H  
P R Kimball  
Grafton N H  
John M Wilson  
Groveton N H  
Dartmouth College Obs'y  
Hanover N H  
Saml Wadsworth  
Keene N H  
Lake Winipiseogee  
Cotton and Woolen M'n'g Co  
Lakeport N H  
J D Howe  
Lancaster, N H  
Charles Nurse  
Littleton N H  
W Little  
Manchester N H  
Wm A Allen  
Monroe N H  
Chas H Webster  
Nashua N H  
W C Gale  
Newton N H  
J L Binford  
North Conway N H  
D L Crosby  
Peterborough N H  
Miss Helen M Clark  
Plymouth N H  
G C Ward  
Sanbornton N H  
N B Waters  
Stratford N H  
A R Sweetzer  
Tilton N H  
E A Knowlton  
Walpole N H  
A A Higgins  
West Milan N H

**New Jersey.**

H Allaire  
Allaire N J  
David C Bowen  
Asbury Park N J  
F S Dilks  
Barnegat N J  
John H Eadie  
Bayonne N J  
Rev W J Leggett  
Belleville N J  
Samuel J Hixson  
Belvidere N J  
Prof C F Richardson  
Beverly N J  
L I Hopkins  
(Billingsport)  
Pauisborough N J  
H A Jordan  
Bridgeton N J  
C L Swain  
Boonton N J  
John Pinkerton  
Butler N J  
L R Dey  
Camden N J  
Dr J F Leaming  
Cape May C H N J  
S A Miller  
Deckertown N J  
Wm C Harris  
Dover N J  
H Y Postma  
Egg Harbor City N J  
J B Drake  
Elizabeth N J  
Dr I H Levy  
Franklinville N J  
Miss A S Yard  
Freehold N J  
H C Perry  
Friesburg N J  
R N Cornish  
Gillette N J

James P Scullin  
Hammonton N J  
M M Cook  
Hanover N J  
C M Norton  
Hightstown N J  
Dr F C Price  
Imlaystown N J  
Geo Fleming  
Junction N J  
Dr F W Larrison  
Lambertville N J  
W L Lance Jr  
(Lancewood)  
Whiting N J  
G W Hackenbury  
Locktown N J  
Wm T Wilson  
Millville N J  
T J Beans  
Moorestown N J  
John B Collins  
Mt Holly N J  
F W Ricord  
Newark N J  
G C Sonn  
Newark N J  
Mrs G H Cook  
New Brunswick N J  
C V Meyers  
New Brunswick N J  
E W McGann X  
New Brunswick N J  
D L Foster  
Newton N J  
W Lake  
Ocean City N J  
Rev S W Knipe  
Oceanic N J  
J T Probert  
Paterson N J  
E A Rodewald  
Pensauken N J  
John Neagle  
Plainfield N J  
S Haines  
Rancocas N J  
J Fleming  
Readington N J  
A C Holdrum  
River Vale N J  
W H Lawson  
Salem N J  
P Hardcastle  
Somerville N J  
Dr W J Chandler  
South Orange N J  
D T Atwood  
Tenaflly N J  
M G Pohl  
Toms River N J  
E R Cook  
Trenton N J  
Wm W Austin  
Vineland N J  
H L Sabsovich  
Woodbine N J

**New Mexico.**

A Knell  
Albert N Mex  
M R Gaines  
Albuquerque N Mex  
L R E Paulin  
Bloomfield N Mex  
E A Sutherland  
Chama N Mex  
Dr Francis H Adams  
East Las Vegas N Mex  
S W Loomis  
Embudo N Mex  
E A Clemens  
Estalina Sps (via)  
Magdalena N Mex  
F W McSchoolie  
Folsom N Mex

Post Surgeon  
Fort Bayard N Mex  
Post Surgeon  
Fort Wingate N Mex  
J E Whitmore  
Gallinas Spring N Mex  
E M Cosner  
Halls Peak N Mex  
J E Smith  
Hillsborough N Mex  
Mrs H T Findley  
La Luz N Mex  
Agr Exp Sta  
Las Cruces N Mex  
Richard Pohl  
Los Lunas N Mex  
E K Caldwell  
Monero N Mex  
C J Collyer  
Olio N Mex  
Arthur C Stokes  
Roswell N Mex  
H B Hersey X  
Santa Fé N Mex  
C N Anthony  
Socorro N Mex  
L Hines  
Springer N Mex  
Wm L McClure  
Taos N Mex

**New York.**

A E Cooley  
Adams Center N Y  
H R Ainsworth M D  
Addison N Y  
H A Wilder  
Akron N Y  
Prof F A Greene  
Albion N Y  
W H Bassett  
Alfred Center N Y  
Otto Ruhl  
Amersand N Y  
Prof John P Slocum  
Angelica N Y  
J D Tate  
Arcade N Y  
Miss Etta L Wilcox  
Arkwright N Y  
Asa Adams  
Atlanta N Y  
S F Gould  
Avon N Y  
S C Suydam  
Baldwinsville N Y  
Merritt M Clark  
Bedford N Y  
Supt State Hospital  
Binghamton N Y  
Dr Wm H Koss  
Brentwood N Y  
Dr F A Winne  
Brockport N Y  
D B Stillman  
Brookfield N Y  
Prof H Priest  
Canton N Y  
Thomas Manning  
Carmel N Y  
Rev R J Thompson  
Carthage N Y  
Director Met'l Observatory  
Central Park New York City  
Dr Z A Spendley  
Chenango Forks N Y  
W S Blaisdell  
Cherry Creek N Y  
Chas E Taylor  
Constableville N Y  
G Pomeroy Keese  
Cooperstown N Y  
Prof D L Bardwell  
Cortland N Y  
C E Hallegas  
DeKalb Junction N Y

F W Squires  
Demster N Y  
M R Hulce  
Deposit N Y  
Wm Bolling  
Dunkirk N Y  
H Tabor  
(Easton)  
Greenwich N Y  
Wm P Hunt  
(Eden Centre)  
Eden N Y  
Oscar Snyder  
Ellis N Y  
Gerty Brothers  
Elmira N Y  
T P Yates  
(Factoryville)  
Waverly N Y  
Robert Warwick  
Fleming N Y  
Post Surgeon  
Fort Niagara  
Youngstown N Y  
H J Davis  
Friendship N Y  
J P Crouch  
Galway N Y  
Mrs N S Yates  
Geneva N Y  
C L Williams  
Glens Falls N Y  
L W Chamberlain  
Gloversville N Y  
James Hyatt  
(Honeymead-brook)  
Bangall N Y  
Chas E Whitney  
Humphrey N Y  
Jno Harris  
Italy Hill N Y  
Engineering Dept  
Cornell University  
Ithaca N Y  
Prof E A Fuertes X  
Ithaca N Y  
R M Hardinge X  
Ithaca N Y  
C L Bishop  
Jamestown N Y  
R E Cronkhite  
Kings Station N Y  
Henry A Stone  
(Kingston)  
Rondout N Y  
Arthur K Harrison  
Lebanon Springs N Y  
Wm L Annin  
Le Roy N Y  
W D Lovell  
Lockport N Y  
C S Rice  
Lowville N Y  
Phillip J Mullin  
Lyon Mountain N Y  
Dr M A Veeder  
P O Box 602 Lyons N Y  
Post Surgeon  
Madison Barracks  
Sackets Harbor N Y  
Albert B Johnson  
Malone N Y  
Dr S Talcott  
Middletown N Y  
Edward A Smiley  
Minnewaska N Y  
J E White  
Mt Morris N Y  
M D Clinton  
Newark Valley N Y  
Luther Leonard  
(Newfield Summit)  
Trumbull Corners N Y  
G A Yates  
New Lisbon N Y  
C A Wooster  
North Hammond N Y

Chas Fenton Number Four N Y	Mrs R L Beall Lenoir N C	H H Mott Grafton N Dak	J W Sage (Chicago Junction) Chicago Ohio	G F Copeland Millport Ohio
Dr P M Wise Ogdensburg N Y	T F Lee Lewiston N C	University North Dakota Grand Forks N Dak	E T M Williams Clarksville Ohio	Simon Waterston Montpelier.Ohio
J P Davis Oxford N Y	Prof L W Bagley Littleton N C	T F Branch Jamestown N Dak	G A Hyde S5 Kennard st Cleveland Ohio	W H Harper Mountville Ohio
E B Bartlett (Palermo) Vermillion N Y	Prof S D Bagley Louisburg N C	L C Stanford Kelso N Dak	J A Sell Coalton Ohio	Jos A Hook New Alexandria Ohio
W H Jeffers (near Perry City) Trumansburgh N Y	R F Bell Lynn N C	Miss H H Holton Lakota N Dak	L Reeve Colebrook Ohio	C Hall New Berlin Ohio
C J Fuller Phoenix N Y	J A Sinclair Marion N C	Rev G A Harvey Mayville N Dak	Hon L N Bonham Columbus Ohio	Dr A M Beers New Comerstown Ohio
Post Surgeon Plattsburgh Barracks N Y	M V Prince May N C	E S Foley Medora N Dak	C M Strong Columbus Ohio	Wm H Slabuck New Holland Ohio
Prof John M Dolph Port Jervis N Y	A A Harbin Mocksville N C	A C O Lomen Milton N Dak	Ohio State University Columbus Ohio	H D Gowey North Lewisburgh Ohio
G W F Smith Potsdam N Y	Geo I White Morganton N C	S S Marsh Minto N Dak	Mrs Edith E L Boyer Dayton Ohio	S Edgerton North Royalton Ohio
Vassar College Obs'y Poughkeepsie N Y	J W Ashby Mt Airy N C	Julius H Hoof Napoleon N Dak	E P Hooker Defiance Ohio	Prof F F Jewett Oberlin Ohio
Wm Weaver Quaker Street N Y	Prof H T J Ludwig Mt Pleasant N C	W A Power Power N Dak	B R Ault Demos Ohio	E U Hyde Orangeville Ohio
Dr H C Sutton Rome N Y	W G Boyd Newbern N C	M V Hostetter Reynolds N Dak	A C Allen Ellsworth Ohio	J N Ridenour Pataskala Ohio
J H Coryell Romulus N Y	Prof Geo S Willis Oak Ridge N C	John Cryderman St Johns N Dak	C W Goodspeed Elyria Ohio	Ed Pence Piqua Ohio
Selah B Strong Setauket N Y	Prof A H Merritt Pittsborough N C	H B Walton (Sykeston) Carrington N Dak	Prof A C Redding Findlay Ohio	C T Coates Plattsburg Ohio
James E Wilson South Canisteo N Y	Dr Herbert B Battle X Raleigh N C	C A McKean Wahpeton N Dak	Robbins Bros. Fostoria Ohio	Dr D N Allard Pomeroy Ohio
D C Sharpe South Kortright N Y	C F von Hermann X Raleigh N C	Peter Ross Wild Rice N Dak	O A Cory Frankfort Ohio	Dr D B Cotton Portsmouth Ohio
R T Church Turin N Y	T C Harris Raleigh N C	Peter M Cudhie Willow City N Dak	S M Luther Garrettsville Ohio	A Shinn Ridge Ohio
Thomas Birt Utica N Y	Dr J M Stansil Rockingham N C	C L Thomson Woodbridge N Dak	Dr T W Gordon Georgetown Ohio	W T Chapman Ridgeville Corners Ohio
H C Orr Varysburg N Y	Dr James A Wise Roxborough N C	Miss Sophia C Long Yule N Dak	Dr A D Cole Granville Ohio	J B Gish Rittman Ohio
M F Webster Victor N Y	J A Hedrick Salisbury N C		W B Longstreth Gratiot Ohio	T G Briggs Sharon Center Ohio
H C Townsend Wappingers Falls N Y	Robt P McAnally Saxon N C		Dones Bros Greenfield Ohio	T B Arnett Shenandoah Ohio
George A Fairbank Watertown N Y	Miss Adelaide Gardner Shelby N C		J E Bentley Green Hill Ohio	A H Hoge Shepherdstown Ohio
Dr F E Stewart Watkins N Y	David M Sholar Sloan N C		C G Katzenberger Greenville Ohio	George Olinger Springborough Ohio
O F Corwin Wedgwood N Y	R J Noble Smithfield N C		J B Conn Hackney Ohio	B B Heaslitt Strongsville Ohio
W H Robinson West Chazy N Y	H L Kimrey Soapstone Mount N C		James Bull Hanging Rock Ohio	N C Scott Sylvania Ohio
Post Surgeon Military Academy West Point N Y	Paul Clark Southern Pines N C		Rev Edward Seymour Harbor Ohio	D D Thomas Thurman Ohio
Post Surgeon Willets Point Whitestone N Y	E V Zoeler Tarboro N C		J W Doncaster Hillhouse Ohio	Prof T H Sonnedecker Tiffin Ohio
	H H Harrison Warrenton N C		J N Hogsett Hillsborough Ohio	J T Dickey Tyrone Ohio
	T A Clark Weldon N C		Prof G H Colton Hiram Ohio	Dr A Billhardt Upper Sandusky Ohio
	H Clay Williams Willeyton N C		Dr J B Owsley Jacksonboro Ohio	W M Smith Van Wert Ohio
			L J Demarest Kenton Ohio	John Courtright Walnut Ohio
			G W Nowels Killbuck Ohio	M D McCorkle Warren Ohio
			J D Haderman Leipsic Ohio	Thomas Mikesell Wauseon Ohio
			J C Levering Levering Ohio	D Lorbach Waverly Ohio
			Dr G W Dallison Logan Ohio	E B Michener Waynesville Ohio
			W S Dean Lordstown Ohio	Prof J Haywood Westerville Ohio
			J W Frye Lowell Ohio	L S Motte West Milton Ohio
			Prof T D Biscoe Marietta Ohio	Dr F Young Weymouth Ohio
			E H Raffensberger Marion Ohio	Mrs E P Wheeler Wheeler Ohio
			Miss Nellie McGrath McArthur Ohio	Ohio Agri Exp Station Wooster Ohio
			C H Morris McConnelsville Ohio	A G Frost Youngstown Ohio
			S B Eveland McLuney Ohio	
			L H Burgess Milfordton Ohio	



Wm Weselhoff Burnett Okla Post Surgeon Fort Reno Okla Post Surgeon Fort Sill Okla S C Grasham Gate City Okla Morris Collar Guthrie Okla Perry Rodkey Keokuk Falls Okla Henry C Sweet Mangum Okla James I Widmeyer X Oklahoma City Okla Mrs Gertrude Sherbourne Ponca Okla Miss Cosette Stratton Sac & Fox Agency Okla Dr J C Neal Stillwater Okla J M Rice Winnview Okla	Capt W Harris McMinnville Oregon A C Muecke (Miramont Farm) Aurora Mills Oregon Rev Dr Urban Fisher S J Mount Angel Oregon Edmund Robinson Newberg Oregon Dr H J Fuller New Bridge Oregon John E Mathews Newport Oregon J H Zahner Pendleton Oregon B S Pague X Portland Oregon C T Roberts Salem Oregon Hon J A Wright Sparta Oregon F M Chrisman (Silver Lake) Prineville Oregon S L Brooks The Dalles Oregon Dr H W Vincent Toledo Oregon F McDonald Vale Oregon G W Dallas Vernonia Oregon Miss Lavina Wagner Wagner Oregon M A Baker Weston Oregon W C Stiles Williams Oregon	Wm Shipe Hamburg Pa Prof J A Stewart Hollidaysburg Pa John Torrey Honesdale Pa Prof W J Swigart Huntingdon Pa E C Lorentz Johnstown Pa G H Kemp Kane Pa B P Kirk Kennett Square Pa R J Mickey Kilmer Pa Lewis T Lampe Lancaster Pa H L Shull Lansdale Pa G W Hayes Lebanon Pa Geo W T Warburton Le Roy Pa Prof Wm G Owens Lewisburgh Pa Howard Miller X Lewisburgh Pa J T Ambrose Ligonier Pa Prof J A Robb Lock Haven Pa Murray Forbes Lycippus Pa Chas Graves Meadville Pa Thos F Sloan McConnellsburgh Pa W T Butz New Castle Pa Dr Geo M Grim Ottsville Pa J C Trautwine 3301 Haverford st W Philadelphia Pa John E Codman Bureau of Water Philadelphia Pa H L Ball X Philadelphia Pa John Comly 1529 Centennial Ave Philadelphia Pa Franklin Institute X Philadelphia Pa Knowles Croskey Phoenixville Pa R C Stover Point Pleasant Pa Dr Chas Moore Pottstown Pa J L Heacock Quakertown Pa Franklin Yager Reading Pa Miss E A G Apple Saegerstown Pa Dr T B Orchard (Salem Corners) Hamlinton Pa J A Roth Seisholtzville Pa J M Boyer Selins Grove Pa B W Dambley Skippack Pa Armstrong & Brownell Smethport Pa Geo Lowder (Smiths Corners) Point Pleasant Pa W M Schrock Somerset Pa B M Hall South Eaton Pa Prof Wm Frear State College Pa	Prof Susan J Cunningham Swarthmore Pa Wm Hunt Uniontown Pa H D Deming Wellsborough Pa Dr J C Green West Chester Pa Harry Alger Westtown Pa A W Batterly Wilkes Barre Pa Chas Beecher Wysox Pa Mrs L H Grenewald York Pa	F J Cross (Cross) Etta Mine S Dak Geo E Masters De Smet S Dak A A Humphrey Faulkton S Dak G A Perly Flandreau S Dak M K Judy Forestburg S Dak W F Smith Forest City S Dak Post Surgeon Fort Meade S Dak Post Surgeon Fort Sully S Dak Wm B Tapley Frankfort S Dak Wilbur Varnum Gale S Dak Dr W H Gates Gary S Dak Frank Drew Highmore S Dak Geo Melchert Hotch City S Dak R S Person Howard S Dak S W Glenn X Huron S Dak A S Stuver Kimball S Dak W T Dale Mellette S Dak J C Russell Midland S Dak D W Diggs Millbank S Dak J E Gilbert Mitchell S Dak J W Strouse Oelrichs S Dak Mrs M F Goddard Onida S Dak B W Kumler Parker S Dak J S Headley Parkston S Dak Jno C Dresson Piedmont S Dak G D Young Plankinton S Dak James F Cross Rosebud S Dak L V Schneider Salem S Dak Dr E S Carter Sioux Falls S Dak J H Warren Spearfish S Dak E G Merriam Travere S Dak H Richmond Tyndall S Dak University of South Dakota Vermillion S Dak M Maury Watertown S Dak Arthur Betts Webster S Dak J F Zimmerman Wentworth S Dak Harvey M Russ Wessington Springs S Dak G W Fink Wolsey S Dak	
<b>Oregon.</b> John Briggs Albany Oregon James W Smith Arlington Oregon F H Carter Ashland Oregon K N Staehr Bake Oven Oregon Geo Bennett Bandon Oregon T L Arnold Beulah Oregon W C Byrd Burns Oregon E S Penfield Canyon City Oregon State Agr'l College Corvallis Oregon Miss E Bicknell Corvallis Oregon W B Emmons Crook Oregon Dr G Wigg (East Portland) Portland Oregon Prof S E McClure State University Eugene Oregon C A Gilchrist Fife Oregon Pacific University Forest Grove Oregon J S Gray Gardiner Oregon Miss Jennie A Recher (Glenora) via Bay City Oregon J B Paddock Grants Pass Oregon J H Neal (Happy Valley) Diamond Oregon A Smith Heppner Oregon Dr P G Barrett Hood River Oregon W H Goudy Hubbard Oregon E Britt Jacksonville Oregon J D McCully Joseph Oregon A Y Beach Lake View Oregon J K Romig La Grande Oregon Saml T Malehorn Langlois Oregon L A Miller Lone Rock Oregon	<b>Pennsylvania.</b> Dr C B Dudley Altoona Pa O V Metzger (Aqueduct) Logania Pa J Grathwohl Blooming Grove Pa Prof J G Cope Bloomsburgh Pa A H Boyle Blue Knob Pa David H Harvey (Browsers Lock) Oaks Pa J E Pague Carlisle Pa G W Ludwig Chambersburg Pa W T Gordon Coatesville Pa Dr M H Boye Coopersburg Pa Wm Loveland Corry Pa T H Walton Doylestown Pa J R Wagner Drifton Pa Theo Day Dyberry Pa F C Wintermute East Mauch Chunk Pa Dr J W Moore Easton Pa C F Sweet Edinborough Pa T B Lloyd Emporium Pa J C Hilsman (Forks of Neshaminy) Rush Valley Pa G W Wood Frederick Pa E C Wagner Girardville Pa N Moore Grampian Pa	<b>Rhode Island.</b> N G Herreshoff Bristol R I N Helme Kingston R I Agr Exp Station Kingston R I G W Pratt Lonsdale R I Thos Dunn Newport R I C H Cannon Olneyville R I J H Walker Pawtucket R I Office City Engineer Providence R I Ladd Observatory Providence R I D W Hoyt Providence R I	<b>South Carolina.</b> Dr C F McGahan Aiken S C J H Harmon X Columbia S C W P Daggett Conway S C J P McNair Kitchings Mills S C W G Peterson (Longshore) Newberry S C H D Elliott Port Royal S C Miss N L Dawson Simpsonville S C J J Lucas Society Hill S C Dr W W Anderson Statesburgh S C E Gaillard Trial S C J Pagan Winnborough S C J R Schorb Yorkville S C	<b>South Dakota.</b> D G Gallette Aberdeen S Dak W S Hill Alexandria S Dak Thos Aschroft Ashcroft S Dak I H Cobb Bowdle S Dak E A Cooper Britton S Dak Prof Louis McLouth Brookings S Dak Lewis P Shew Carthage S Dak W F Van Dervoort Castlewood S Dak H J Bennett Clark S Dak	<b>Tennessee.</b> J K P Wallace Andersonville Tenn Rev C F Williams Ashwood Tenn P B Calhoun Austin Tenn Miss Daisy Bell Bethel Springs Tenn

Miss Mary Smith Bolivar Tenn	Prof C S Newhall Brownwood Tex	Hamilton Foster Roby Tex	W B Gates 55 Elmwood Avenue Burlington Vt	H J Heuser Wytheville Va
J D Coe Byrdstown Tenn	W M Spitler Burnet Tex	Capt Robt Strachan Rockport Tex	H L Bixby Chelsea Vt	<b>Washington.</b>
Prof J A Lyon Clarksville Tenn	G H Chipman Childress Tex	Thos Wood Round Rock Tex	C H Lane Cornwall Vt	W B Mack Aberdeen Wash
J I Hall Covington Tenn	T O James Coldwater Tex	Gus A Duerler jr San Antonio Tex	J H Mears Enosburgh Falls Vt	W H Mossman Chehalis Wash
L Boynton Dunlap Tenn	Prof Duncan Adriance College Station Tex	G H Hutchins Sierra Blanca Tex	E A English Hartland Vt	Charles Johnson Chelan Wash
J C Diemer Fayetteville Tenn	W A Crowder Colorado Tex	C M Tilford (Silver Falls)	Hon Geo E Stratton Hyde Park Vt	Buffum Bros Clyde Wash
Chas W Anderson Florence Station Tenn	W H Hamilton Box 169 Corsicana Tex	Prof H A Evans Sulphur Springs Tex	Miss Martha French Jacksonville Vt	Adam Stoneberger Colfax Wash
Dr John A Campbell Franklin Tenn	G A Eisenlohr Dallas Tex	W Goodrich Jones Temple Tex	Chas W Brown Norwich Vt	Prof W W Hutton Davenport Wash
W H Brown Greeneville Tenn	J A Whitfield Devine Tex	G W Henrichson Twohig Tex	Chas A Brown Saxtons River Vt	Rev S R S Gray East Sound Wash
F H Sargent Harriman Tenn	Anthony Blum Durham Tex	Erskin B Barden Victoria Tex	Mrs J J Allbee Simonsville Vt	Miss Ruth Kernahan (Elbe) Eatonville Wash
T E Search Harrogate Tenn	J C Edgar Duval Tex	<b>Utah.</b>	Geo H Manchester South Royalton Vt	R Lee Barnes Ellensburg Wash
R Downey Hohenwald Tenn	J A Feddeman Eastland Tex	Henry Fennimore Beaver Utah	H F J Scribner Strafford Vt	Frank Oviatt Ferry Wash
W C Hall Jacksboro Tenn	F E Black (Fay) Care Obs Weather Bur El Paso Tex	F W Quinn Bingham Utah	A Whitehead Vernon Vt	Jno W Clendening Fort Simcoe Wash
Hon T C Long Jackson Tenn	Henry T Williams (Flower Bluff)	R Forrester Castle Gate Utah	E R Pember Wells Vt	Post Surgeon Fort Spokane
L P Nelson Lookout Mountain Tenn	J N Morris Corpus Christi, Tex	Agent R G & W R R Cisco Utah	H F Dunham Woodstock Vt	Post Surgeon Miles Wash
J H Burrow Lynnville Tenn	Post Surgeon Forestburgh Tex	Willard Rogers Deseret Utah	<b>Virginia.</b>	Post Surgeon Fort Townsend
G W Martin (Missionary Ridge)	Post Surgeon Brownsville Tex	J J Starley Fillmore Utah	Edw L C Scott Ashland Va	Port Townsend Wash
9 East 8th street Chattanooga Tenn	Post Surgeon Ft Clark Brackettville Tex	Post Surgeon Fort Duchesne Utah	D MacGregor Avon Va	R M Hoskinson Madrone Wash
Dr J D Plunket X Nashville Tenn	Post Surgeon (Camp Eagle Pass)	Agent R G & W R R Green River Utah	W N Stone Bedford City Va	H B Scudder North Yakima Wash
J B Marbury X Nashville Tenn	Post Surgeon Eagle Pass Tex	B F Cooke Grouse Creek Utah	J W Fox Sr Big Stone Gap Va	R C Willis Olga Wash
H C Bate X Nashville Tenn	Post Surgeon Ft Hancock Tex	John Crook Heber Utah	C R Moore Birdsnest Va	Observer Weather Bureau X Olympia Wash
Dr L W Hooper Newport Tenn	Post Surgeon Ft McIntosh Laredo Tex	F Blumel (Lake Park)	W O Frith Blacksburgh Va	Thomas M Whitcomb (Pine Hill) Lyle Wash
W C Thompson Nunnally Tenn	Post Surgeon Rio Grande City Tex	William Brown Farmington Utah	O A Brown Cape Charles Va	State Agri College Pullman Wash
R S Montgomery Palmetto Tenn	A Striegler Fredericksburgh Tex	Thos A Jeffery Loa Utah	A H Tuttle Charlottesville Va	Hans Mumm Rosalia Wash
J C Williamson Parksville Tenn	D F Ragsdale Gainesville Tex	James Dryden Utah Exp Sta	D A Heatwole Dale Enterprise Va	Alpheus Byers Seattle Wash
Ruskin Fergusson Riddleton Tenn	D D Bryan X Galveston Tex	E Caffall Logan Utah	H W Weiss Emporia Va	Wm Van Woert Silver Creek Wash
Miss Carrie Nugent Rogersville Tenn	I M Cline X Galveston Tex	Agent R G & W R R Manti Utah	Albert Olszewski Falls Church Va	Dr C P Culver Tacoma Wash
Dr W F G Wilson Rugby Tenn	A B Grant Graham Tex	R Moncur Mt Carmel Utah	Miss Jane S Worcester Hampton Va	Prof L P Venen Vashon Wash
C L Hefner Savannah Tenn	W J Crowley Grape Vine Tex	H Crouse Moab Utah	C W Richardson Hot Springs Va	R W Starr Waterville Wash
W J Breeding Spring Dale Tenn	Dr J E Lay Hallettsville Tex	Alex Matheson Parowan Utah	Prof Edward Kinne Irwin Va	<b>West Virginia.</b>
J Hardie Johnson Sweet Water Tenn	F Lusby Hartley Tex	T H Martin Provo City Utah	Prof H D Campbell Lexington Va	B P Ferrill Box 700 Bluefield W Va
G W Davidson Tullahoma Tenn	K D Blankenship Highland Tex	O J Spencer Randolph Utah	J N Ryker X Lynchburgh Va	Dr D T E Casteel Buckhannon W Va
Dr C Buchanan Waynesborough Tenn	J C Rickli (Kent) Fort Davis Tex	Sarah Johnson Richfield Utah	A T Lincoln Marion Va	J Benninger Central Station W Va
N L Bartholomew	Capt J W Davis Llano Tex	Seth A Pymm Saint George Utah	G Dunn Nottoway C H Va	A Thomas Davis W Va
<b>Texas.</b>	G L Stone McGregor Tex	G N Salisbury X Salt Lake City Utah	Prof J M Colson Jr Petersburgh Va	J J Tierney Elkhorn W Va
S J Overton Albany Tex	Louis Runge Menardville Tex	Henry Cullum (Singletree)	W H Pleasants Richmond Va	Henry Resseger Ella W Va
Charles F Mercer Arlington Tex	S G Lackey Mesquite Tex	Agent R G & W R R Schofield Utah	Prof S C Wells Salem Va	Levi Johnson Glenville W Va
Prof H B Wayland Aurora Tex	Dr J C Riley Mountain Spring Tex	J Robbins Snowville Utah	L S Bristow Jr Saluda Va	O G Augir Grafton W Va
Dr Q C Smith Austin Tex	Capt Julius Geisecke New Braunfels Tex	James Hughes Stockton Utah	B W Jones Spottsville Va	Lon H Hutchinson Huntington W Va
Ernest Kruger Austin Tex	C Runge X New Ulm Tex	<b>Vermont.</b>	W N Parrott Stanardsville Va	J E Murdoch Kingwood W Va
Dr J F Weatherhead Boerne Tex	A L Rush Ochiltree Tex	W H Childs Brattleboro Vt	W C Hedrick Staunton Va	Andrew Price Marlinton W Va
W H Potter (Bear Creek)	E H Snider Panter Tex		W B Steele Stephens City Va	Geo W Van Metre Martinsburgh W Va
H Stevens Brazoria Tex *	Robert H Henry Quanah Tex		Clifford H Constable Warsaw Va	West Virginia University Morgantown W Va
				John W Chapman New Cumberland W Va



N Bandi New Martinsville W Va L W Nuttall Nuttallburgh W Va T G Field Parkersburgh W Va W W Dent X Parkersburgh W Va D Titchenell Pleasant Hill W Va W D Holmes Point Pleasant W Va Ed Corder Spencer W Va G H Trembly Tannery W Va J A Minnick Weston W Va Christian Schnepf Wheeling W Va	R F Goellner Butternut Wis B C Curtis Cadiz Wis R C Worthington Centralia Wis John Erb Columbus Wis Hon John Masbaum Crandon Wis A E Brainerd Cumberland Wis E S Austin Delavan Wis Joseph G Lawton De Pere Wis Rev W N Sloane Eau Claire Wis John Halter Florence Wis J C Wedge Fond du Lac Wis James C Jensen Grantsburgh Wis S N D Smith Harvey Wis O E Rice Hayward Wis Prof E V Wernick Hillsborough Wis Prof E P Frost Hudson Wis E B Heimstreet Janesville Wis Rev A Brown Juneau Wis E S Koepenick Koepenick Wis Edward Pollock Lancaster Wis A J Looze Lincoln Wis	Washburn Observatory Madison Wis Miss Johanna Lups Manitowoc Wis J H Treat Meadow Valley Wis Dr F Robert Zeit Medford Wis A Pillsbury Menomonie Wis W L Moore X Milwaukee Wis P W Peterson Mineral Point Wis Wm Heaslett Neillsville Wis Aug A Paulsen New Holstein Wis John Bender Oconomowoc Wis W K Smith Oconto Wis C W Staples Osceola Mills Wis J Rufus Hunter Oshkosh Wis Dr O G Frink Pepin Wis R C Kann Port Washington Wis Frank Cornelius Prairie du Chien Wis Rev E M Corey Raymond Wis Allen B West Reedsburg Wis C W Guldager Rhineland Wis J G Skeels Sharon Wis Col W S Wood Shawano Wis	E R Daniels Shell Lake Wis E W Crane Sparta Wis W O Lamoreux Stevens Point Wis J N King Valley Junction Wis F W Alexander Viroqua Wis Chas J Salick Watertown Wis A V B Dey Waukesha Wis Robert Reynolds Weston Wis Robert Reynolds Weston Wis W Phillips Westfield Wis W D Buchholz Whitehall Wis	J S Meyer Lander Wyo Prof B C Buffum Laramie Wyo J H Barron Lusk Wyo J D Parker Saratoga Wyo Sheridan Exp Farm Sheridan Wyo Sundance Exp Farm Sundance Wyo M R Johnston Wheatland Wyo
<b>Wisconsin.</b>				
A J Smith Amherst Wis Clem F Kimball Appleton Wis North Wisconsin Academy Ashland Wis Wm Toole Baraboo Wis E W Pierce Barron Wis Prof F W Denison Bayfield Wis Chas Crane Beaver Dam Wis Prof C A Bacon Beloit Wis L M Burt Black River Falls Wis				
<b>Wyoming</b>				
W D Pickett (Big Horn Ranch) Arland Wyo Post Surgeon Camp Pilot Butte Rock Springs Wyo E M Ravenscraft X Cheyenne Wyo L F Black Evanston Wyo Post Surgeon Fort McKinney Wyo Post Surgeon Fort Yellowstone Mammoth Hot Springs Wyo Post Surgeon Fort Washakie Wyo				
<b>Foreign.</b>				
Dr C F Hering Burnside (Coronie) Colony of Surinam Dutch Guiana S A G J Gibbs Grand Turk Turks Islands Brit W I Wm S Barr Hamilton Bermuda Prof T Scherer Port au Prince Haiti Rev Benito Vines S J Belen College Obs'y Havana Cuba G Murdock St Johns New Brunswick Prof M Leal Leon Guanajuato Mexico J C Herring Topolobampo Sinaloa Mexico G Baturoni Vera Cruz Mexico				

## STATIONS OF THE WEATHER BUREAU.

Station.	Observer.	Station.	Observer.	Station.	Observer.
<i>First Order.*</i>					
Abilene, Tex.	Allen Buell.	Lander, Wyo.	R. M. Crawford.	Columbia, Tex.	J. S. Rogers.
Albany, N. Y.	A. F. Sims.	Leavenworth, Kans.	E. A. Welsh.	Corsicana, Tex.	E. L. Gibson.
Alpena, Mich.	H. McP. Baldwin.	Lexington, Ky.	V. E. Muncy.	Cuero, Tex.	Dr. J. M. Reuss.
Atlanta, Ga.	David Fisher.	Little Rock, Ark.	F. H. Clarke.	Dallas, Tex.	H. P. Berry.
Augusta, Ga.	Park Morrill.	Los Angeles, Cal.	G. E. Franklin.	Hearne, Tex.	W. A. Snell.
Baltimore, Md.	David Fisher.	Louisville, Ky.	Frank Burke.	Houston, Tex.	D. K. Saunders.
Bismarck, N. Dak.	Dr. C. P. Cronk.	Manchester, N. H.	J. H. Melton.	Huntsville, Tex.	W. V. Barr.
Boston, Mass.	Wm. H. Fallon.	Meridian, Miss.	Geo. Haas Hagen.	Luling, Tex.	G. E. Fisher.
Buffalo, N. Y.	J. Warren Smith.	Miles City, Mont.	H. R. Boynton.	Longview, Tex.	J. W. Krech.
Chicago, Ill.	D. Cuthbertson.	Mobile, Ala.	Jas. A. Barry.	Orange, Tex.	J. H. Kelly.
Cincinnati, Ohio.	Dr. H. C. Frankenfeld.	Montgomery, Ala.	Arthur E. Hackett.	Tyler, Tex.	W. A. Harrel.
Cleveland, Ohio.	S. S. Bessler.	Montrose, Colo.	P. J. Bolton.	Waco, Tex.	W. H. Godber.
Colorado Springs, Colo.	U. G. Stockman.	New London, Conn.	R. K. Laszley.	Weatherford, Tex.	B. H. Ledbetter.
Columbus, Ohio.	C. M. Strong.	Northfield, Vt.	Wm. Line.	Little Rock, Ark. (center).	
Denver, Colo.	F. J. Wals.	North Platte, Nebr.	J. C. Piercy.	Brinkley, Ark.	A. J. Hahn.
Des Moines, Iowa.	J. J. Gilligan.	Oklahoma, Okla. T.	Jas. I. Widmeyer.	Forrest, Ark.	J. H. Bard.
Des Moines, Iowa.	J. S. Hazen.	Oswego, N. Y.	J. G. Linsley.	Helena, Ark.	A. J. Gaschen.
Detroit, Mich.	E. A. Evans.	Palatine, Tex.	M. H. Perry.	Malvern, Ark.	Jos. Coffey.
Dodge City, Kansas.	Geo. T. Todd.	Parkersburg, W. Va.	W. W. Dent.	Newport, Ark.	R. C. McMann.
Duluth, Minn.	B. H. Bronson.	Pensacola, Fla.	E. C. Easton.	Paris, Tex.	C. E. Thorne.
Eastport, Me.	D. C. Murphy.	Pierre, S. Dak.	W. A. Shaw.	Pine Bluff, Ark.	J. E. O'Connor.
El Paso, Tex.	N. D. Lane.	Point Barrow, Alaska.	L. M. Stevenson.	Prescott, Ark.	Wm. Frigana.
Galveston, Tex.	Dr. I. M. Cline.	Port Angeles, Wash.	Wm. Bell.	Russellville, Ark.	O. M. Ellsworth.
Havre, Mont.	Chas. W. Ling.	Port Huron, Mich.	Wm. M. Edmondson.	Tuxarkana, Ark.	M. J. Nash.
Helena, Mont.	E. J. Glass.	Portland, Me.	E. P. Jones.	Memphis, Tenn. (center).	
Huron, S. Dak.	S. W. Glenn.	Pueblo, Colo.	F. H. Brandenburg.	Arlington, Tenn.	A. T. B. Etheridge.
Indianapolis, Ind.	C. F. R. Wapenhans.	Raleigh, N. C.	C. F. von Herrmann.	Batesville, Miss.	J. M. Cox.
Jacksonville, Fla.	E. R. Demain.	Rapid City, S. Dak.	Wm. Norrington.	Bolivar, Tenn.	W. F. McCarley.
Kansas City, Mo.	P. Connor.	Red Bluff, Cal.	John J. McLean.	Brownsville, Tenn.	W. A. Roberts.
Keeler, Cal.	H. E. Wilkinson.	Red Wing, Minn.	F. T. Williams.	Corinth, Miss.	W. O. Henson.
Key West, Fla.	H. B. Boyer.	Sacramento, Cal.	J. A. Barwick.	Covington, Tenn.	W. N. White.
Knoxville, Tenn.	Henry Pennywitt.	Saint Vincent, Minn.	H. W. Grasse.	Decatur, Ala.	J. M. Vickray.
Lynchburg, Va.	J. N. Ryker.	San Antonio, Tex.	L. F. Passaligau.	Dyersburg, Tenn.	H. G. Wood.
Manistee, Mich.	S. L. Doshier.	Sandusky, Ohio.	B. F. Hough.	Hernando, Miss.	L. B. Jones.
Marquette, Mich.	H. R. Patrick.	Seattle, Wash.	G. H. Willson.	Holly Springs, Miss.	N. T. Bryant.
Memphis, Tenn.	W. M. Wilson.	Shreveport, La.	C. A. Smith.	Milan, Tenn.	O. F. Cantwell.
Milwaukee, Wis.	W. L. Moore.	Sioux City, Iowa.	U. G. Purasell.	Tusculum, Ala.	John Lasseter.
Moorhead, Minn.	J. W. Byram.	Southport, N. C.	Louis Dorman.	Mobile, Ala. (center).	
Nantucket, Mass.	B. A. Blundon.	Springfield, Ill.	John Craig.	Aberdeen, Miss.	O. L. McKay.
Nashville, Tenn.	J. B. Marbury.	Springfield, Mo.	T. S. Collins.	Columbus, Miss.	W. B. Hopkins.
New Haven, Conn.	H. J. Cox.	Stanton, Fort, N. Mex.	Mrs. M. H. Bailey.	Evergreen, Ala.	Mattie Lee.
New Orleans, La.	R. E. Kerkam.	Tatoosh Island, Wash.	Frank R. Beahan.	Livingston, Ala.	L. J. Marby.
New York City.	E. B. Dunn.	Titusville, Fla.	Jos. E. Lanouette.	Macon, Miss.	B. J. Allen.
Norfolk, Va.	A. B. Crane.	Tucson, Ariz.	Wm. Burrows.	Okolona, Miss.	S. J. Russell.
Olympia, Wash.	H. F. Alcatore.	Valentine, Nebr.	John Fitzgerald.	Thomasville, Ala.	J. N. Cammack.
Omaha, Nebr.	Geo. E. Hunt.	Walla Walla, Wash.	Fitzhugh Newman.	Waynesboro, Miss.	W. R. McKinley.
Philadelphia, Pa.	L. M. Dey.	Wichita, Kans.	Dr. Fred L. Johnson.	Montgomery, Ala. (center).	
Pikes Peak, Colo.	U. G. Myers.	Winnemucca, Nev.	Geo. D. Boucher.	Eufaula, Ala.	O. T. Moore.
Pittsburg, Pa.	O. D. Stewart.	Woods Holl, Mass.	J. P. Slaughter.	Fort Deposit, Ala.	W. L. Van Pelt.
Portland, Oregon.	B. S. Pague.	Yankton, S. Dak.	A. J. Davis.	Marion, Ala.	Ira J. Davis.
Rochester, N. Y.	A. L. White.	<i>Third Order.†</i>		Opelika, Ala.	W. L. Carmack.
Roseburg, Oregon.	Thos. Gibson.	Astoria, Oregon.	John Grover.	Pine Apple, Ala.	J. B. Raab.
Saint Louis, Mo.	W. H. Hammon.	Auburn, Ala.	Prof. P. H. Mell.	Union Springs, Ala.	T. P. Wade.
Saint Paul, Minn.	E. C. Thompson.	Cape Henry, Va.	J. P. Sherry.	New Orleans, La. (center).	
Salt Lake City, Utah.	Geo. N. Salisbury.	Columbia, Mo.	H. A. McNally.	Alexandria City, La.	L. C. Giffe.
San Diego, Cal.	M. L. Hearne.	Crete, Nebr.	J. H. Harmon.	Amite, La.	Florence Hills.
San Francisco, Cal.	F. Jenkins.	Curtis Creek, N. C.	John A. Blagden.	Brookhaven, Miss.	E. M. Bee.
Santa Fe, N. Mex.	E. B. Rexford.	East Chatham, Wash.	R. S. Dinnick.	Cheyenneville, La.	W. W. Wall.
Sault Ste. Marie, Mich.	C. L. Bozell.	Escanaba, Mich.	J. C. Morrell.	Coushatta, La.	L. M. Howard.
Savannah, Ga.	P. H. Smyth.	Ithaca, N. Y.	R. M. Hardinge.	Hailebury, Miss.	B. Fugate.
Spokane, Wash.	Chas. Stewart.	Mico, Fla.	H. P. Hardin.	Lafayette, La.	J. J. Davidson.
Tampa, Fla.	Thomas J. Considine.	Minneapolis, Minn.	E. A. Beals.	Minden, La.	W. S. Hunter.
Toledo, Ohio.	E. A. Hanner.	Narragansett Pier, R. I.	Mrs. M. E. Conway.	Natchez, Miss.	C. Steutenroth.
Vicksburg, Miss.	Dr. Robert J. Hyatt.	Neah Bay, Wash.	Charles Adie.	Natchitoches, La.	Sam Levy.
Washington, D. C.	S. W. Beall.	New Brunswick, N. J.	E. W. McGann.	Port Gibson, Miss.	H. H. Crisler.
Wilmingon, N. C.	F. P. Chaffee.	Point Reyes Light, Cal.	T. R. Ryan.	Savannah, Ga. (center).	
Yuma, Ariz.	A. Ashenberger.	Port Crescent, Wash.	Otto B. Hart.	Albany, Ga.	J. S. Clark.
<i>Second Order.†</i>		Pyshit, Wash.	J. P. Fallishee.	Alapaha, Ga.	C. I. Jones.
Amarillo, Tex.	Wayland Bailey.	Topeka, Kans.	W. B. Jennings.	Americus, Ga.	L. A. Smith.
Atlantic City, N. J.	J. W. Bauer.	Vineyard Haven, Mass.	T. W. Neifert.	Bainbridge, Ga.	J. E. Peacock.
Baker City, Oregon.	C. H. Stuller.	<i>Special Cotton Region Stations.‡</i>		Cordele, Ga.	W. D. Webster.
Block Island, R. I.	Wm. Davis.	Atlanta, Ga. (center).		Eastman, Ga.	C. H. Peacock.
Buford, Fort, N. Dak.	E. C. Hobbs.	Columbus, Ga.	J. W. Long.	Fort Gaines, Ga.	S. E. Lewis.
Cairo, Ill.	E. H. Emery.	Gainesville, Ga.	R. T. Murphy.	Gainesville, Fla.	James Bell.
Canby, Fort, Wash.	R. O. Williams.	Greenville, S. C.	Mrs. S. A. Crittenden.	Millen, Ga.	R. T. Sheppard.
Carson City, Nev.	Ford A. Carpenter.	Griffin, Ga.	P. H. McDowell.	Quitman, Ga.	A. W. Thomas.
Charleston, S. C.	L. N. Jesunofsky.	Macon, Ga.	W. M. Craven.	Thomasville, Ga.	Robt. Thomas, Jr.
Charlotte, N. C.	I. G. Gardiner.	Newman, Ga.	Nora M. Avery.	Way Cross, Ga.	W. P. Whelphy.
Chattanooga, Tenn.	L. M. Pindell.	Spartanburg, S. C.	F. P. Robinson.	Vicksburg, Miss. (center).	
Cheboygan, Mich.	J. H. Clery.	Toccoa, Ga.	J. K. Dixon.	Jackson, Miss.	H. S. Wright.
Cheyenne, Wyo.	E. M. Ravenscraft.	West Point, Ga.	J. A. Erwin.	Lake, Miss.	Willie Wilkins.
Clemson College, S. C.	B. R. Stuart.	Augusta, Ga. (center).		Monroe, La.	W. W. Renwick.
Concordia, Kans.	L. M. Tarr.	Allendale, S. C.	C. B. Farmer.	Rolling Fork, Miss.	S. W. Langford.
Corpus Christi, Tex.	George Reeder.	Athens, Ga.	W. P. Briggs.	Wilmington, N. C. (center).	
Dubuque, Iowa.	S. C. Emery.	Batesburg, S. C.	D. P. Hartley.	Cheraw, S. C. (center).	W. R. Goffrey.
Erie, Pa.	Peter Wood.	Blackville, S. C.	S. S. Turner.	Florence, S. C.	P. H. Walsh.
Eureka, Cal.	Maurice Connell.	Camak, Ga.	J. A. Chapman.	Goldsboro, N. C.	Nettie Thomas.
Fort Smith, Ark.	R. Q. Grant.	Greenwood, S. C.	W. D. Vance.	Greensboro, N. C.	G. W. Pritchett.
Fresno, Cal.	J. R. Williams.	Union Point, Ga.	R. F. Bryan.	Lumberton, N. C.	B. M. Davis.
Grand Haven, Mich.	Geo. W. Felger.	Washington, Ga.	Lucy V. Kemp.	Newbern, N. C.	W. G. Boyd.
Green Bay, Wis.	F. W. Conrad.	Waynesboro, Ga.	H. W. Blount.	Weldon, N. C. (center).	T. A. Clarke.
Hannibal, Mo.	Wm. E. Butler.	Charleston, S. C. (center).		<i>Sugar and Rice Stations.‡</i>	
Harrisburg, Pa.	Frank Ridgway.	Green Pond, S. C.	E. G. Strobel.	New Orleans, La. (center).	
Hatteras, N. C.	H. B. Dick.	Hardeeville, S. C.	W. J. Evans.	Baton Rouge, La.	H. A. Morgan.
Idaho Falls, Idaho.	James H. Smith.	Kingstree, S. C.	T. F. Willis.	Covington, La.	W. B. Franklin.
Jupiter, Fla.	A. J. Mitchell.	St. Georges, S. C.	W. G. Sease.	Donaldsonville, La.	W. D. Park.
Kearney, Nebr.	H. H. Curley.	St. Matthews, S. C.	J. S. Wannamaker.	Franklin, La.	E. M. Cornay.
Keokuk, Iowa.	F. Z. Gosewisch.	Galveston, Tex. (center).		Lake Charles, La.	Wm. Meyer.
Kittyhawk, N. C.	Walter H. Scholl.	Belton, Tex.	A. J. Embree.	Opelousas, La.	E. J. Clements.
La Crosse, Wis.	W. U. Simons.	Brenham, Tex.	J. G. Sloan.	Rayne, La.	I. A. Smith.
				Schriever, La.	John T. Moore.

\* Take two observations daily, and also record continuously important meteorological phenomena, such as wind-direction and velocity, precipitation, temperature, barometric pressure, etc., by means of self-registering instruments. † Take two observations daily. ‡ Take one observation, in addition to other special duties. § Take one observation daily from April 15 to November 30 each year, and telegraph it to district centers (regular Weather Bureau stations).